

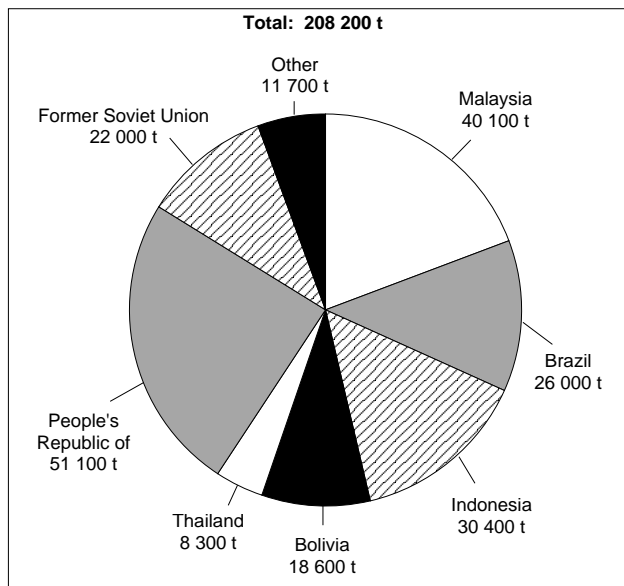
Tin

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World mine production of tin in 1994 is expected to be about equal to the 1993 level of 182 000 t, after three consecutive years of decline. Lower production occurred in Brazil and Malaysia due to continued low tin prices and declining grades, but increased in Peru and Vietnam. World tin metal production is expected to be about 214 000 t compared to 208 000 t in 1993. World consumption of refined tin is estimated to be 224 000 t in 1994, an increase of 2% from 1993. The price of tin on the London Metal Exchange (LME) averaged US\$2.48/lb in 1994 compared to \$2.34/lb in 1993.

Figure 1
World Production of Tin Metal, 1993^P



Source: *World Nonferrous Metal Statistics*.
^P Preliminary.

The Association of Tin Producing Countries (ATPC) extended its supply rationalization scheme and set export quotas for member countries for 1995. Brazil agreed in principle to join the ATPC in 1995.

CANADIAN DEVELOPMENTS

Canada did not produce any tin concentrates or refined tin in 1994 (Canada's only tin mine, Rio Algom Ltd.'s East Kemptville mine, closed in 1992). Consumption of tin in Canada in 1993 was 3250 t. The major domestic use was in solders, accounting for 49% of consumption, which is similar to the rate in recent years. The second most important use was in tinsplate and tinning at 42%. However, beverage can producers in Ontario, the only ones to use tin-plated steel, switched to aluminum in 1994.

In January, a private mining company, Piskahegan Resources Ltd., acquired the Mount Pleasant tungsten-molybdenum project in New Brunswick. Mount Pleasant is a former tungsten and molybdenum producer. The deposit has a proven reserve of 9 Mt of tungsten-molybdenum mineralization and 5 Mt of tin-indium-bismuth mineralization.

WORLD DEVELOPMENTS

World mine production of tin was expected to be similar to that of 1993. Production cuts in Brazil and Malaysia were due to continuing low tin prices and declining grades. These reductions were offset by increased production from Peru and Vietnam.

Tin smelters in Brazil and Germany closed during the year and production at others in Thailand and Brazil was curtailed due to concentrate shortages. However, refined tin production remained high in China.

China far exceeded the 1994 export quotas it agreed to in joining the ATPC. Late in the year, China introduced stricter export regulations in an attempt to curb exports of tin.

China

China produced 46 000 t of tin in concentrate in 1993, ranking first in world mine production of tin. The majority of Chinese production originates in Yunnan, Guangxi, Guangdong, Jiangxi and Hunan provinces and on the island of Hainan. The Dachang Mining Administration operates two tin mines, the Copper Pit and Gaofeng mines, in Guangxi province. Production in 1993 was 12 000 t of tin in concentrate, which represented over one quarter of Chinese mine production of tin.

China was also the world's largest producer of refined tin in 1993, accounting for 51 100 t. Although tin consumption in China has been rising, much of its production is exported. The country announced new export regulations in September after exceeding, by 10 100 t in the first eight months of the year, the 1994 export quota agreed to in joining the ATPC. The regulations, which apply to refined tin, unwrought tin alloys and tin ore, require exporters to hold export licences issued by local authorities.

Indonesia

Indonesia's state-owned PT Tambang Timah, which produces 85% of the country's tin and is one of the world's lowest-cost producers, received permission to be publicly listed on the Jakarta Stock Exchange in 1995. Indonesia exports 95% of its tin metal production. With strong demand in Southeast Asia, the Indonesian government has indicated that, should privatization of PT Tambang Timah take place, Indonesia would likely exceed its 1995 ATPC export quota of 30 500 t.

PT Tambang Timah completed an 8900-t/y expansion at its Mentok smelter with the installation of a sixth furnace. Capacity at Mentok now stands at 42 400 t/y of refined tin. Renison Goldfields Consolidated Ltd. also announced plans to construct a 13 000-t/y tin smelter. The new US\$4 million smelter would be located near the company's Koba alluvial tin mine on Bangka Island. First tin production is planned for mid-1996.

In 1993, Indonesia ranked second in world mine production of tin, producing 28 600 t of tin in concentrate. Refined tin production was 30 400 t, ranking Indonesia third in the world.

Malaysia

Malaysia has consistently declined in importance as a producer of tin in concentrate in recent years. Dredging operations have been especially hard-hit by low tin prices and rising operating costs. Berjantai Tin Dredging Bhd, which operated eight dredges, ceased tin mining late in 1993. Malaysia produced 10 400 t of tin in concentrate in 1993, a 28% decrease from the total in 1992. Further decreases have

occurred in 1994 with only 3200 t of tin in concentrate being produced in the first half of the year. At the end of June 1994, 38 tin mines were in operation in Malaysia compared to 141 at the end of 1990.

Imports increased in 1994 as Malaysia's two smelters operated at levels similar to 1993. In the first half of 1994, tin-in-concentrate imports were 27 600 t compared to 48 700 t for the whole of 1993. Malaysia produced 40 100 t of refined tin in 1993, second in the world to China.

Malaysia Smelting Corp. Bhd. (MSC) announced that it plans to build a treatment facility for low- and medium-grade tin concentrates near its Butterworth smelter, at a cost of up to US\$8 million. The facility would upgrade lower-quality ores from China, Vietnam, Africa and Myanmar. MSC is also upgrading its tin smelting business to produce more tin with a purity of 99.99%.

Brazil

Brazil produced 25 900 t of tin in concentrate in 1993, ranking it third in the world behind China and Indonesia. Mine production of tin was expected to be much lower in 1994. Parapanema SA, the country's largest tin producer, announced a 50% cut in tin production for 1994 in order to help boost tin prices. Production was also expected to be lower at the Bom Futuro mine in Rondonia state where the number of independent "garimpeiro" miners has dropped due to low tin prices. The mine also experienced a landslide in April in which 19 miners died.

Brazil, which agreed in principle to join the ATPC in 1995, also had an ATPC export quota of 20 200 t for 1994. However, exports were expected to be well below this total. Brazilian tin producers reduced export levels after the introduction on July 1, 1994, of Brazil's new currency, the Real, the value of which remained strong on international money markets.

Brazil produced 26 000 t of refined tin in 1993, ranking the country fourth in the world. Production in 1994 is expected to be about the same. In June, SNA Minerios e Metais Ltda closed its 500-t/y tin smelter in Sao Paulo state due to shortages in tin ore. Concentrate shortages are also affecting production at the Companhia Estanifera do Brasil (Cesbra) tin smelter in Rio de Janeiro state, which is currently operating at 20% of its 12 000-t capacity. Cesbra's contract to toll smelt 8000-11 000 t/y of Peruvian tin concentrate has not been renewed, due in part to the Peruvian government's desire to build a tin smelter in Peru.

Bolivia

Bolivian mine production of tin is expected to be well below the country's 1993 production of 18 600 t of tin in concentrate. Corporacion Minera de Bolivia (Comibol) closed several uneconomic mines, including

its Catavi mine. Currently, only the Huanuni, Colquiri and Caracoles mines remain open. Brazil's Paranapanema plans to re-open the Catavi mine after investing US\$10 million. However, the plan has met with intense public opposition in Bolivia.

Bolivia plans to privatize its state-owned tin, lead, zinc and silver industries in 1995. A private consultant has drafted a privatization plan and bankers have been appointed to promote the sale of Comibol.

Peru

Peru has become an important producer of tin concentrates in recent years. In 1993, the country produced 13 700 t of tin in concentrate, but production in 1994 is expected to be well above this total. Peruvian production increased by 52% in the first eight months of 1994, compared to the same period in 1993. The increase was due to higher production levels at Minsur SA's high-grade San Rafael mine.

Minsur is planning to build a US\$19 million tin smelter on the coast of Peru with a capacity to produce 15 500 t/y of refined tin (99.9% purity). The smelter would use the Australian Ausmelt smelting technology. Currently, all of Peru's mine production of tin is exported, mainly to Brazil, Bolivia and Malaysia.

Commonwealth of Independent States

The majority of tin production in the Commonwealth of Independent States (C.I.S.) is from Russia. The Russian tin mining industry continued to be plagued by high taxes, and high energy and freight costs in 1994. The Khrustalnenskaya Tin Mining Company announced that it would have to cut mine production from 4000 t to 1500 t of tin in concentrate in 1994. The C.I.S. produced 11 100 t of tin in concentrate in 1993, the majority from Russia.

Russia's largest tin smelter, at Novosibirsk, continued to suffer from feed shortages and its poor location as a toll smelter for foreign concentrates. Officials at Novosibirsk have initiated discussions with Russian tin producers in hopes of forming a single financial and industrial group. Novosibirsk officials believe that such an integrated mining/refining group would be able to introduce better technology and improve cooperation between mining and metallurgical enterprises. C.I.S. refined tin production in 1993 was 22 000 t, all from Russia.

Thailand

Thai mine production of tin fell to 2500 t in the first nine months of 1994, a 45% decrease compared to the same period in 1993. The scarcity of domestic and foreign concentrates led Thailand Smelting and Refining Co. Ltd. (Thaisarco), Thailand's only tin refiner, to cut refined tin production by 28% to 5800 t

in the same period. Thaisarco indicated in November that it would import more concentrates in 1995 in order to meet its 1995 target of 10 000 t of refined tin.

Thailand's Council of Economic Ministers agreed to transform the state-owned Offshore Mining Organization (OMO) into a joint-venture company with private firms. The OMO's existing offshore tin mining concessions are to be included in the new company's assets.

United States

The Defense Logistics Agency (DLA), authorized by Congress to sell up to 12 000 t of tin from the National Defense Stockpile in fiscal year 1994, sold 5780 t in that period. The DLA also concluded a long-term sale of an additional 5760 t. For fiscal year 1995, the 12 000-t limit has again been authorized. The DLA had originally considered selling half of this amount on a long-term basis, but eventually excluded it from long-term solicitations.

Other

Renison Goldfields plans to develop reserves beneath the current workings at its Renison tin mine in Australia. Development of the additional reserves is expected to extend the mine's life by up to 13 years and allow for an increase of 1000 t/y in production to over 9000 t/y of tin in concentrate.

The state-owned Kamativi tin mine in Zimbabwe closed in June after several years of financial losses. The Zimbabwe government has been considering turning over the mine to the private sector.

Carnon Holdings Ltd. raised more than £1 million in a share issue to keep the South Crofty tin mine in England operating. The proceeds were to be used for mine development and equipment replacement. With the successful share issue, £30 million in loans was waived by the U.K. government and RTZ Corporation PLC.

Metallgesellschaft AG announced in May the closure of its tin smelter in Duisburg, Germany. Although the Duisburg smelter has a capacity of 10 000 t/y of refined tin, production averaged 4000 t/y in recent years.

RECYCLING

Efforts continue to be made in improving the recycling rate for tin-plated steel containers. According to the Tin Can Recycling Council, the amount of tin-plated steel recycled in Canada rose from 35 600 t in 1990 to 68 900 t in 1993.

The Manitoba government has proposed changes to the Beverage Container and Packaging Regulation

under the province's *Waste Reduction and Prevention Act*. The proposed changes include a levy on packaging, to be paid by brand-owners, in order to set up a province-wide recycling program. Ontario, which currently has a bluebox recycling program, is examining proposals to have industry pay a greater portion of its cost.

In the United States, according to the Steel Can Recycling Institute (SCRI), more than 1.2 Mt of steel cans were recycled in 1993 resulting in a recycling rate of 48%. This compares to a rate of 41% in 1992 and 34% in 1991. The U.S. steel industry's goal is for an overall recycling rate of 66%.

The lowest rate of recycling for steel cans is in the general line, which includes containers for such products as paints, varnish and aerosols. Once only collected through household hazardous waste collection programs or magnetically at some specialized facilities, more of these cans are now being recycled through curbside recycling programs. The SCRI has called for the increased recycling of general line steel containers. It has also set up educational programs and a toll-free telephone line to disseminate information on steel can recycling facilities.

INTERNATIONAL ORGANIZATIONS

The Association of Tin Producing Countries

The Association of Tin Producing Countries (ATPC) is an organization consisting of eight tin-producing states: China, Malaysia, Indonesia, Thailand, Bolivia, Australia, Zaire and Nigeria. In 1993, ATPC countries represented only 39% of total world mine production of tin. However, with China joining the Association in 1994, ATPC countries now represent approximately 64% of world tin production. This percentage will rise even further if Brazil follows through with its decision in principle to join the ATPC in 1995.

The ATPC began a supply rationalization scheme in March 1987. Its objective was to accelerate the absorption of the huge tin inventories caused by the cessation of the International Tin Council buffer stock operations and to prevent further price declines. The program involved the establishment of yearly export quotas among its members. Brazil, although not a member of the ATPC, has cooperated in recent years in limiting its exports of tin.

After the formation of the supply rationalization scheme, stock levels dropped from 73 000 t to an estimated 31 500 t at the end of 1992. However, stocks have since climbed to an estimated 42 400 t by the end of September 1994. The ATPC considers 20 000 t to be a normal stock level for tin. In September, the ATPC agreed to extend the supply rationalization

scheme for 1995. Some members in recent years have called for a discontinuation of the scheme, contending that it is ineffective in reducing global tin stocks. The ATPC agreed to lower 1995 exports by member countries to 90 600 t from the 1994 total of 98 000 t. Individual quotas were set as follows: Australia, 7800 t; Bolivia, 16 600 t; China, 20 000 t; Indonesia, 30 500 t; Malaysia, 8200 t; Nigeria, 1900 t; Thailand, 4500 t; and Zaire, 1100 t. Brazil has agreed to keep 1995 exports at the 1994 level, estimated to be about 28 500 t.

Research Organizations

The International Tin Research Institute (ITRI) is entrusted with the task of maintaining and extending the use and effectiveness of tin in modern technology. Its headquarters and laboratories are in Uxbridge, England, and it maintains information centres in Belgium and the United States. Formerly funded by ATPC member countries, the organization was privatized as of January 1, 1995, and is now known as IRTA Ltd. As a result, private tin-producing companies are now responsible for funding and any liabilities arising from research and development activities. The aim of the new association is to create an additional 20 000-30 000 t/y in tin consumption within three years.

The ITRI is currently concentrating on research in a number of end-use fields such as tin-based flame retardants and smoke suppressants, lead-free solders and solderable coatings for use in electronics, new plating techniques for tin-plate applications, and lead-free, high-tin alloy capsules for wine and spirit bottles.

The ITRI has also commercialized a new cyanide-free tin-zinc plating system known as Stanzec (75% tin, 25% zinc). Testing of this alloy is currently being undertaken for use in tinplate. The alloy is considered a cheaper, environmentally friendly, anti-corrosion coating for steel. Applications are also expected in the automotive and aerospace industries in fasteners.

The South-East Asian Tin Research and Development (SEATRAD) Centre is a regional organization established and funded by the governments of Indonesia, Malaysia and Thailand, with assistance from the Economic and Social Commission for Asia and the Pacific, and other United Nations agencies. The purpose of the centre is to promote, conduct and coordinate research and training in relation to the technical and economic aspects of exploration, mining, mineral processing and smelting of tin. The centre's headquarters and laboratory are located in Ipoh, Malaysia. In December 1993 SEATRAD's Board of Directors decided to close the centre because member countries no longer represent a majority of world tin production. The closure was effective January 1, 1995.

USES

Solder recently surpassed tinplate as the largest market for tin and currently represents approximately one third of tin consumption in the Western World. In Canada, it accounts for about 50% of tin consumption. Strong growth in the electronics industry, which accounts for over 50% of tin used in solders, has provided a new impetus for tin use. Increasing miniaturization in electronics has led to the development of higher quality solder pastes capable of finer printings. Increasing environmental concerns over lead content in solders and tin-based solderable coatings has resulted in the research and development of lead-free products for the electronics industry to meet possible future legislation. The IRTI has recently developed a solder of over 90% tin.

The amount of tin in solder depends on the application, with the current average being 30-70%. In tin-lead solders, tin is the active metal forming the bond with the metals being joined. The lead serves to lower the melting point of the solder. For higher temperature applications, alloys of high tin content (above 95% tin) are often used. The tin is alloyed with small amounts of antimony or silver.

Metals such as bismuth or indium may be added to tin-based solders to lower the melting point. Such solders are known as fusible alloys. One such alloy is Indalloy 227, which has a composition of 77.2% tin, 20% indium and 2.8% silver. A recently developed use for fusible alloys is in the manufacture of plastic components with complex internal structures for use in the automotive and aerospace industries. These components are made using a casting of tin-bismuth or tin-lead-antimony alloy which can then be melted away without damaging the delicate internal configuration of the plastic part.

Tinplate is the second most important use and accounts for almost one third of world tin metal consumption. Tinplate use in the canning industry has been under severe competitive pressures from aluminum, except for large containers where, due to rigidity problems with aluminum, tin-plated steel is still preferred. Can manufacturers in Canada and the United States have increasingly switched to aluminum in the production of beverage cans. However, in December, Coca Cola Ltd. announced that it was negotiating with its main can suppliers to use a greater proportion of tin-plated steel cans in its European and Asian markets. Aluminum prices increased by 29% in 1994, prompting this consideration.

Initiatives to reduce the weight of steel cans have been ongoing for several years. Weirton Steel Corporation and its joint-venture partners, Usinor Sacilor SA and Nippon Steel Corporation, have developed a tinplate using light gauge, high tensile steel which, they hope, will enable can-makers to produce

a beverage can 20% lighter than existing steel cans. British Steel has developed an "ultimate can" which is supposedly 30% cheaper than aluminum cans and uses thinner steel but similar proportions of tin to current steel cans.

Tinplate competition also comes from non-tin-coated steels, polymer-coated steel, and tin-free steel (TFS). TFS is steel plate which is electrolytically coated with a thin layer of metallic chrome and chrome oxide.

The fastest growing use for tin has been in chemical applications where consumption has risen steadily in the past few decades. Tin is used in an array of inorganic and organic chemicals, and for application as plastic (polyvinyl chloride) stabilizers, agricultural pesticides, anti-fouling paints for ships, and biocidal compounds for the protection of materials such as paints, textiles and building materials.

Recent research has shown the effectiveness of tin-based compounds as flame and smoke inhibitors. As fire retardants, these compounds are non-toxic, safe and easy to handle, and have a wide range of applications. Two such compounds, zinc hydroxystannate and zinc stannate, are being marketed worldwide for use as fire retardants and smoke inhibitors for polymeric materials.

Tin is also used for tinning (which includes electronic uses, hot dipping and electroplating in the electronics industry), in the manufacture of pewterware, and in bronze, brass and other tin-containing alloys. Tin-containing alloys are used in construction, machinery and equipment, and consumer durables. Tin-zinc alloys are known for their corrosion resistance. A recently developed and commercialized tin-nickel alloy electroplating process has led to coatings that are characterized by their hardness, good lubricating qualities and attractive appearance. The requirement for environmentally safe plating systems and finishes has, as with most other applications of tin, resulted in increased research into developing and promoting tin-based products as non-toxic materials.

The use of tin capsules for sealing wines represents a promising new market for tin. Recent bans on the use of tin-lead capsules for sealing wines have led to the successful introduction of tin capsules in wine bottling. Tin is suitable for this purpose because it is considered to be non-toxic, is easily adapted to existing capping technology, forms an attractive, high-quality product, and can be easily and safely opened. The International Tin Research Institute, in collaboration with capsule makers in Europe, has developed a tin capsule that is now being commercially produced. The market for this application could potentially consume 4000 t/y of tin.

World tin consumption is estimated at 224 000 t in 1994 compared to 219 700 t in 1993.

PRICES AND STOCKS

The settlement price of tin on the London Metal Exchange (LME) began the year at US\$2.17/lb and reached the year's low of \$2.14/lb on January 7. Prices rose in late January with further mine closures in Malaysia, some speculative activity, and China indicating its intent to limit tin exports in 1994 to 20 000 t. Tin remained in the \$2.35-\$2.55/lb range until late June when first-quarter Chinese export figures indicated that the country's exports would likely far exceed its 1994 quota.

Tin did not rise significantly in price again until early November when strong Asian demand and speculative activity in base metals in general established the year's high of \$2.86/lb on November 15. Prices dropped again in December as speculators moved into other areas and tin closed the year at \$2.73/lb. The average price for tin on the LME for 1994 was \$2.48/lb.

LME tin stocks rose by over 8000 t in 1994 and stood at 28 100 t at year-end. Total world tin stocks were estimated by the ATPC at 42 400 t at the end of September, up from 38 000 t at the end of 1993. A stock level of 20 000 t is considered normal by the ATPC.

OUTLOOK

Tin consumption is forecast to improve in 1995 with

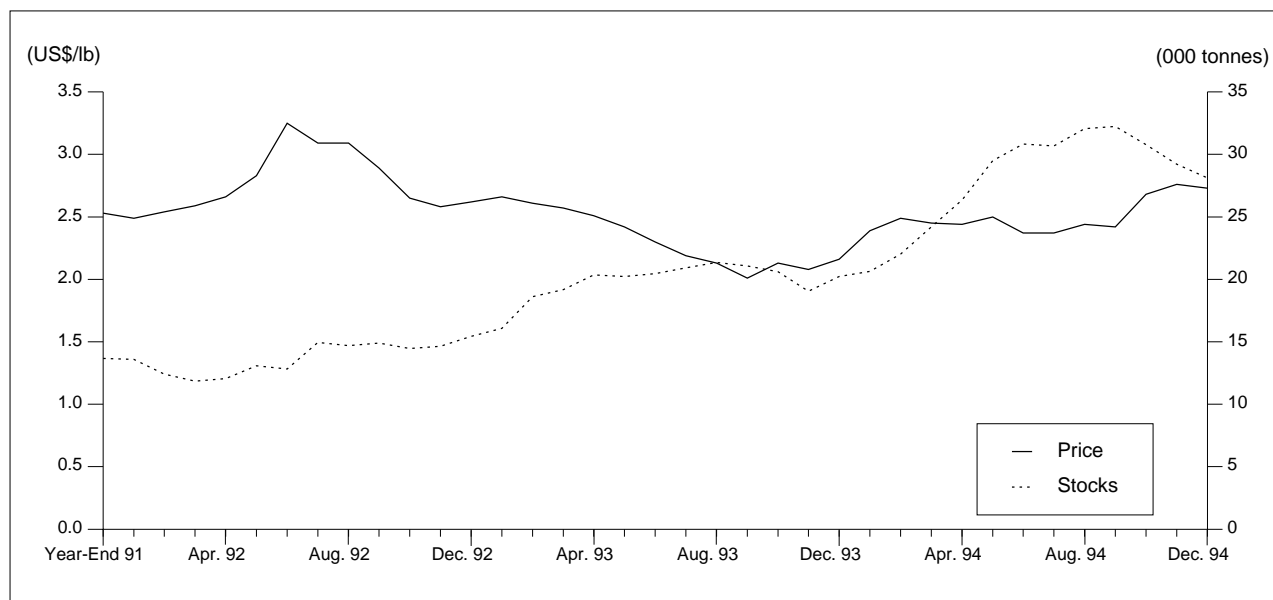
widespread economic recovery. Consumption for tin-plating is expected to experience a slow but steady growth led by strong demand in Korea, China and other Asian countries. With recent increases in aluminum prices, tinplate will likely retain its current market share in the can industry and may increase its share if major soft drink manufacturers proceed with their proposal to use more tin-plated steel beverage cans in 1995. Environmental concerns over lead will likely result in an increased use of tin in solders.

With demand expected to be stronger in 1995, the outlook for tin will depend, to a large extent, on China's ability to control exports and stay within its ATPC quota of 20 000 t. Some smelters will likely continue to experience shortages of feed. However, although further decreases in Malaysian and perhaps Brazilian mine production can be expected, these losses will likely be made up by increased production from Peru, Indonesia and Vietnam. With the privatization of PT Tambang Timah, Indonesian refined tin production will likely increase further.

Should China be successful in curbing tin metal exports and should demand improve in 1995 as expected, tin prices are forecast to rise modestly. The large stock surplus is expected to begin to fall, but not enough in 1995 to cause large price increases. Tin prices are predicted to average US\$2.90/lb in 1995.

Notes: (1) For definitions and valuation of mineral production, shipments and trade, please refer to Chapter 60. (2) Information in this review was cur-

Figure 2
LME Tin Stocks vs. LME Settlement Price, 1992-94



Sources: Reuters; World Nonferrous Metal Statistics.

Note: End-of-month data.

TARIFFS

Item No.	Description	Canada			United States	EU	Japan ¹
		MFN	GPT	USA	Canada	MFN	GATT
2609.00	Tin ores and concentrates	Free	Free	Free	Free	Free	Free
7204.30	Waste and scrap of tinned iron or steel	Free	Free	Free	Free	Free	Free
8001.10	Tin, not alloyed	Free	Free	Free	Free	Free	Free
8001.20	Tin alloys						
8001.20.10	Tin-antimony alloys	Free	Free	Free	Free	Free	3.2%
8001.20.20	Tin-lead-antimony alloys	6%	Free	Free	Free	Free	3.2%
8001.20.90	Other	8.8%	6.5%	Free	Free	Free	3.2%
8002.00	Tin waste and scrap	Free	Free	Free	Free	Free	Free
8003.00	Tin bars, rods, profiles and wire						
8003.00.10	Bars and rods, not alloyed or of tin-antimony alloys	Free	Free	Free	Free	3.2%	3.7%
8003.00.30	Bars and rods, of phosphor-tin alloys	5%	3.5%	Free	Free	3.2%	3.7%
8003.00.50	Bars and rods, of other alloys; profiles; other wire	8.8%	6.5%	Free	Free	3.2%	3.7%
8004.00	Tin plates, sheets and strip, of a thickness exceeding 0.2 mm						
8004.00.10	Of tin-lead-antimony alloys	6%	Free	Free	Free	2.5%	3.7%
8004.00.20	Of phosphor-tin alloys	5%	3.5%	Free	Free	2.5%	3.7%
8004.00.90	Other	8.8%	6.5%	Free	Free	2.5%	3.7%
8005.20	Powders and flakes						
8005.20.10	Powders, not alloyed	3.7%	Free	Free	Free	2.9%	4.9%
8005.20.20	Alloyed powders, flakes	8.8%	6.5%	Free	Free	2.9%	4.9%
8006.00	Tin tubes, pipes and tube or pipe fittings (i.e., couplings, elbows, sleeves)	8.8%	6.5%	Free	Free	4.5%	4.9%
8007.00	Other articles of tin	8.8%	6.5%	3%	0.9%-1.2%	5.3%	5.8%

Sources: Customs Tariffs, effective January 1995, Revenue Canada; Harmonized Tariff Schedule of the United States, 1995; The "Bulletin International des Douanes," Journal No. 14 (16th Edition), European Economic Community, 1992-1993, "Conventional" column; 1st Supplement to Journal No. 14 (16th Edition), European Economic Community, 1993-1994, "Conventional" column; Custom Tariff Schedules of Japan, 1994.

¹ GATT rate is shown; lower tariff rates may apply circumstantially.

Note: Where there is a tariff "range," a complete match of the HS code was not available; therefore, the high and low for the product in question is shown.

rent as of January 20, 1995.

TABLE 1. CANADA, TIN PRODUCTION AND TRADE, 1993 AND 1994, AND CONSUMPTION, 1992 AND 1993

Item No.		1993		1994 ^p	
		(tonnes)	(\$000)	(tonnes)	(\$000)
PRODUCTION					
	Tin content of tin concentrates and lead-tin alloys	-	-	-	-
EXPORTS					
2609.00	Tin ores and concentrates				
	Malaysia	-	-	19	26
	Brazil	-	-	18	16
	Total	-	-	37	43
7204.30	Waste and scrap of tinned iron or steel				
	United States	6 089	1 117	4 595	1 204
	Other countries	348	264	23	9
	Total	6 437	1 382	4 618	1 214
8001.10	Tin, not alloyed, unwrought				
	United States	96	755	176	1 365
	Other countries	...	...	-	-
	Total	96	755	176	1 365
8001.20	Tin alloys, unwrought				
	United States	520	3 500	670	4 451
	Other countries	...	...	35	60
	Total	520	3 500	705	4 512
8002.00	Tin waste and scrap				
	United States	837	436	617	580
	Other countries	-	-	20	7
	Total	837	436	637	588
8003.00	Tin bars, rods, profiles and wire				
	United States	297	1 765	324	2 185
	Other countries	...	1	-	-
	Total	297	1 767	324	2 185
8004.00	Tin plates, sheets and strip, of a thickness exceeding 0.2 mm				
	United Kingdom	-	-	1	14
	United States	16	45	10	10
	Other countries	55	152	...	6
	Total	71	197	11	31
8005.20	Tin powders and flakes				
	South Korea	4	108	3	102
	Other countries	1	27	1	58
	Total	5	136	4	160
8007.00	Tin articles n.e.s.				
	United States	..	3 614	..	4 548
	Other countries	..	2 925	..	2 683
	Total	..	6 544	..	7 234

TABLE 1 (cont'd)

Item No.		1993		1994p	
		(tonnes)	(\$000)	(tonnes)	(\$000)
IMPORTS					
2609.00	Tin ores and concentrates	. . .	. . .	7	67
7204.30	Waste and scrap of tinned iron or steel	2 206	440	6 584	574
8001.10	Tin, not alloyed, unwrought	3 793	26 881	4 432	33 485
8001.20.10	Tin-antimony alloys	35	306	18	134
8001.20.20	Tin-lead-antimony alloys	364	2 061	59	289
8001.20.90	Other tin alloys	318	2 805	168	1 421
8003.00.10.10	Tin bars and rods, not alloyed	2	15	2	16
8003.00.50	Tin bars and rods, of other alloys; profiles; other wire	28	291	79	702
8004.00	Tin plates, sheets and strip, of a thickness exceeding 0.2 mm	17	244	87	897
8005.20.10	Tin powders, not alloyed	5	44	6	56
8005.20.20	Tin alloyed powders, flakes	19	301	36	638
8006.00	Tin tubes, pipes and tube or pipe fittings	11	119	17	176
8007.00.00.10	Other articles of tin, anodes for electroplating	7	70	7	76
		1992		1993p	
			(tonnes)		
CONSUMPTION¹					
	Solder	1 498		1 606	
	Tinplate and tinning	1 294		1 351	
	Babbitt	101		126	
	Bronze	45		41	
	Other uses (including collapsible containers, foil, etc.)	105		126	
	Total	3 042		3 250	

Sources: Natural Resources Canada; Statistics Canada.

- Nil; . . Not available or not applicable; . . . Amount too small to be expressed; n.e.s. Not elsewhere specified; p Preliminary.

¹ Available data as reported by consumers.

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

TABLE 2. CANADA, TIN PRODUCTION, TRADE¹ AND CONSUMPTION, 1975, 1980, AND 1985-94

	Production ²	Exports ³	Imports ⁴	Consumption ⁵
(tonnes)				
1975	319	1 052	4 487	4 315
1980	243	883	4 527	4 517
1985	119	358	3 696	3 511
1986	2 356	3 727	3 925	3 270
1987	3 388	2 778	3 792	3 780
1988	3 787	3 591	4 008	3 489
1989	3 479	2 790	3 862	3 567
1990	3 844	2 828	3 614	3 600
1991	4 392	3 716	3 176	3 178
1992	58	401	3 195	3 042
1993	—	—	3 793	3 250
1994 ^P	—	37	4 432	..

Sources: Natural Resources Canada; Statistics Canada.

— Nil; .. Not available; ^P Preliminary.

¹ Beginning in 1988, exports and imports are based on the new Harmonized System and may not be in complete accordance with previous method of reporting. ² Tin content of tin concentrates shipped plus tin content in lead-tin alloys produced. ³ Tin in ores and concentrates (HS class 2609.00). ⁴ Tin metal (HS class 8001.10).

⁵ Available data as reported by consumers; current coverage exceeds 90% whereas, until 1972, coverage was in the order of 80-85%.

TABLE 3. WORLD TIN PRODUCTION, CONSUMPTION AND PRICES, 1985-94

	Production		Consumption	Prices ²	
	Tin in Concentrates	Metal ¹		LME ³	N.Y. Dealer
	(000 t)			(US\$/lb)	
1985	197	213	216	5.57	5.25
1986	188	201	229	2.87	2.94
1987	186	203	229	3.10	3.15
1988	205	260	237	3.25	3.31
1989	232	262	237	3.93	3.97
1990	215	238	234	2.82	2.88
1991	190	203	218	2.54	2.59
1992	182	199	220	2.77	2.83
1993	182	208	220	2.34	2.39
1994	..	..	..	2.48	2.55

Sources: *World Nonferrous Metal Statistics*; *Metals Week*.

.. Not available.

¹ From primary and secondary material. ² *Metals Week*. ³ London Metal Exchange. For 1987, 1988 and part of 1989, the "Europe Free Market" in-warehouse Rotterdam prices were used to calculate averages.

TABLE 4. WORLD CONSUMPTION¹ OF TIN METAL, 1989-93

	1989	1990	1991	1992	1993P
	(tonnes)				
WESTERN WORLD					
United States	37 200	37 000	37 100	45 100	47 100
Japan	33 500	33 800	34 800	31 000	28 600
Germany	18 600	19 300	20 300	20 400	18 400
United Kingdom	10 200	10 400	10 200	10 400	10 400
France	8 100	8 300	8 200	8 300	7 600
South Korea	5 500	7 800	8 400	8 000	9 100
Brazil	9 000	6 100	.	6 500	4 100
Taiwan	3 900	4 800	6 200	5 900	6 800
Italy	5 900	6 100	5 200	5 500	5 300
Hong Kong	2 500	5 500	5 200	5 000	.
Malaysia	2 500	3 100	3 800	4 600	5 200
Spain	3 500	3 500	3 800	4 300	4 300
Other	41 200	39 600	36 800	29 000	34 300
Total Western World	181 600	185 300	180 000	184 000	176 900
EASTERN COUNTRIES					
Former Soviet Union	24 000	20 000	17 000	15 500	14 500
China, People's Republic of	18 000	18 000	17 000	12 800	21 100
Other	13 300	10 700	3 900	7 500	7 200
Total Eastern countries	55 300	48 700	37 900	35 800	42 800
Total world	236 900	234 000	217 900	219 800	219 700

Source: *World Nonferrous Metal Statistics*.

. . Not available; P Preliminary.

¹ Tin refined from primary and secondary sources.**TABLE 5. WORLD PRODUCTION¹ OF TIN IN CONCENTRATES, 1989-93**

	1989	1990	1991	1992	1993P
	(tonnes)				
WESTERN WORLD					
Indonesia	31 600	30 200	30 100	29 400	28 600
Brazil	50 200	39 100	29 300	28 500	25 900
Bolivia	15 800	17 300	16 800	16 500	18 600
Malaysia	32 000	28 500	20 700	14 300	10 400
Peru	5 100	4 800	6 600	10 200	13 700
Thailand	14 700	14 600	10 900	8 400	4 700
Australia	7 800	7 400	5 400	6 600	8 100
Portugal	–	1 300	3 100	3 000	5 300
Other	16 100	13 900	11 700	6 100	5 500
Total Western World	173 300	157 100	134 600	123 000	120 800
EASTERN COUNTRIES					
China, People's Republic of	40 000	42 000	42 100	43 000	46 000
Former Soviet Union	14 000	13 000	12 000	12 000	11 100
Other	5 000	3 200	1 100	3 500	3 600
Total Eastern countries	59 000	58 200	55 200	58 500	60 700
Total world	232 300	215 300	189 800	181 500	181 500

Source: *World Nonferrous Metal Statistics*.

– Nil; P Preliminary.

¹ Recoverable tin content of ores and concentrates produced.

TABLE 6. WORLD PRODUCTION¹ OF TIN METAL, 1989-93

	1989	1990	1991	1992	1993P
	(tonnes)				
WESTERN WORLD					
Malaysia	51 900	49 000	42 700	45 600	40 100
Brazil	44 200	37 600	25 800	28 500	26 000
Indonesia	30 400	30 400	30 400	28 200	30 400
Bolivia	9 700	13 400	14 700	14 400	18 600
Thailand	13 700	15 400	11 000	10 900	8 300
Spain	2 000	1 300	1 700	2 400	2 100
Mexico	4 800	5 000	2 300	2 000	2 500
United Kingdom	10 800	12 000	5 200	..	..
Other	46 300	19 400	13 600	5 400	4 600
Total Western World	213 800	183 500	147 400	137 400	132 600
EASTERN COUNTRIES					
China, People's Republic of	30 500	35 800	36 000	39 600	51 100
Former Soviet Union	14 000	14 000	18 000	20 000	22 000
Other	3 300	5 000	1 800	100	2 500
Total Eastern countries	47 800	54 800	55 800	62 000	75 600
Total world	261 600	235 400	200 500	188 300	208 200

Source: *World Nonferrous Metal Statistics*.

.. Not available; P Preliminary.

¹ Tin refined from primary and secondary sources.

TABLE 7. MONTHLY AVERAGE TIN PRICES, 1993 AND 1994

	N.Y. Dealer		London Metal Exchange	
	1993	1994	1993	1994
	(US\$/lb)			
January	2.72	2.30	2.68	2.24
February	2.67	2.54	2.63	2.47
March	2.62	2.51	2.57	2.45
April	2.59	2.51	2.54	2.44
May	2.55	2.55	2.50	2.50
June	2.37	2.56	2.32	2.50
July	2.30	2.47	2.26	2.41
August	2.23	2.42	2.18	2.34
September	2.09	2.48	2.04	2.41
October	2.18	2.58	2.12	2.48
November	2.16	2.88	2.11	2.79
December	2.23	2.79	2.17	2.70
Yearly average	2.39	2.55	2.34	2.48

Sources: *Metals Week*; *Reuters*.