Lead

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According to preliminary figures of the International Lead and Zinc Study Group (ILZSG), world lead consumption totalled 5 462 000 t in 1995, an increase of 2% over 1994. Lead metal production fell marginally from 1994 to 5 371 000 t, while lead mine production fell by 1% to 2 675 000 t.

Despite small increases in producer, consumer and merchant lead stocks in 1995, total world stocks fell significantly due to a 62% decrease in stocks on the London Metal Exchange (LME), which stood at 132 000 t at the end of 1995.

CANADIAN DEVELOPMENTS

The Canadian mine production of lead totalled an estimated 212 000 t in 1995 compared to 171 000 t in 1994. The increase was primarily due to the re-opening of the Faro operations in the Yukon in August 1995 and the Heath Steele mine in New Brunswick in late 1994.

Lead metal production is estimated at 286 000 t in 1995, compared to 252 000 t in 1994. Increases occurred in both the primary and secondary sectors.

British Columbia

Cominco began construction of its new lead smelter at Trail early in 1995. The smelter will utilize Russian Kivcet technology and will replace Cominco's existing lead smelter. When completed in late 1996, capacity will be increased by 20 000 t to 120 000 t/y of refined lead. In May, lead smelter production was temporarily disrupted when a fire broke out in the conveying and ventilating system of the sinter plant.

Positive results were confirmed in a feasibility study on Redfern Resources Ltd.'s Tulsequah Chief copper-zinc-lead project 70 km northeast of Juneau, Alaska. Tulsequah Chief contains a diluted mineable reserve of 7.9 Mt grading 1.3% copper, 6.4% zinc, 1.2% lead, 100.9 g/t silver and 2.4 g/t gold. Redfern expects a decision in April 1996 on its application for a mine development certificate. The mine could come on stream in early 1998 with production of 5000 t/y of lead in concentrate.

Yukon

Stripping of the Grum lead-zinc orebody at Faro was completed by Anvil Range Mining Corp. and milling commenced in August. Concentrate shipments from the Port of Skagway, Alaska, began in September. Faro has a capacity of 98 000 t/y of lead in concentrate. It was reported that about half of the lead concentrate production was purchased by Korea Zinc.

Cominco Limited continued exploration at its Kudz Ze Kayah zinc-copper-lead project located 115 km southeast of Ross River. The company also acquired permits in preparation for an environmental review of the project. A production decision is expected in early 1996. Meanwhile, Westmin Resources Limited continued drilling on its Wolverine Lake property where a polymetallic deposit similar to Kudz Ze Kayah has been discovered. The Wolverine project is located 20 km to the east of Kudz Ze Kayah.

Northwest Territories

San Andreas Resources Corporation continued drilling on its Prairie Creek lead-zinc-silver project in the Nahanni River area where a lead-zinc-silver vein system has been traced for 2.1 km and is still open along strike. A geological resource of 10.6 Mt grading 11.3% lead, 13.1% zinc and 188 g/t silver has been established. San Andreas plans to conduct in-fill drilling in 1996 toward a feasibility study and permitting. A 1200-t/d mill exists at the Prairie Creek site.

New Brunswick

Brunswick Mining and Smelting Corporation Limited increased capacity at its Belledune lead smelter by 28 000 t/y through process improvements. The smelter now has a capacity of 100 000 t/y of refined lead.

Brunswick Mining and Smelting announced that it planned to move its concentrate-handling facilities

from Dalhousie to Belledune in 1996 to consolidate its shipping close to existing operations. The company operates the Brunswick and Heath Steele lead-zinc-copper mines in the Bathurst area and the Belledune lead smelter. Noranda Inc. acquired a 100% interest in Brunswick Mining and Smelting in 1995. Meanwhile, Noranda continued in-fill drilling on its Half Mile Lake zinc-lead-copper massive sulphide deposit near Bathurst.

Breakwater Resources Ltd. received a positive feasibility study on its Caribou lead-zinc mine near Bathurst. Breakwater hopes to re-open the former producing mine in late 1996. Milling would be at a rate of 3000 t/d to produce separate lead and zinc concentrates. Caribou formerly produced a bulk lead-zinc concentrate, but the mine closed in 1990 due to low lead and zinc prices. Its current capacity would be 20 000 t/y of lead in concentrate. Breakwater also acquired the nearby open-pitable Restigouche lead-zinc deposit from Marshall Minerals Corp. and the company plans to mine this orebody in conjunction with Caribou.

WORLD DEVELOPMENTS

World mine production of lead totalled 2 675 000 t in 1995, a 1% decrease from 1994. Major declines in Europe, Australia and China were partially offset by increases in North America. Despite the declines in production in 1995, lead mine capacity expanded by a net 108 000 t with nine openings, re-openings and expansions totalling 173 000 t compared to four closures totalling 65 000 t. Of the new capacity, 143 000 t were the result of the re-opening of the Faro mine in Canada and the commissioning of the McArthur River mine in Australia.

World lead metal production reached 5 371 000 t in 1995, a 7000-t decrease from 1994. Secondary lead production was expected to be greater than primary production again in 1995 due to the continuing scarcity of lead concentrates and the increase in secondary smelter utilization rates with improving lead prices. With world lead consumption of 5 462 000 t being 91 000 t higher than metal production, the drawdown of lead metal stocks continued during the year.

Primary Production

Asia/Oceania

MIM Holdings Ltd. commissioned its McArthur River underground lead-zinc-silver mine in the Northern Territory in May and began shipping concentrates in August. The mine treats 1.5 Mt/y of ore to produce 350 000 t/y of bulk lead-zinc concentrate containing 45 000 t/y of lead. The majority of concentrate is shipped to MIM-owned ISF smelters at Avonmouth in the United Kingdom and Duisburg, Germany, as well as to Japan. The mine is owned 70% by MIM and 30% by a consortium of Japanese smelting companies.

CRA Ltd. approved development of its US$815 million Century zinc-lead-silver project in Queensland in December. The open-pit mine is scheduled to come on stream in 1998, pending an acceptable agreement with local Aboriginal communities. Century would produce 41 000 t/y of lead in concentrate.

An industrial dispute, which began in February at MIM's Mt. Isa mine, ended in August after the mine's labour union accepted a new package of wages and working conditions. In December, production was again halted by a strike in support of three suspended employees. MIM also experienced production losses at its nearby Hilton mine due to a shortage of ore caused by past deferral of mine development.

Broken Hill Proprietary Company Limited (BHP) approved development of its Cannington lead-zinc-silver deposit in Queensland and associated concentrate-handling facilities at Townsville on the Queensland coast. The mine could begin production in 1997 producing 150 000 t/y of lead in concentrate, making it one of the world's largest lead mines. Cannington has proven, probable and possible reserves of 45 Mt grading 11.1% lead, 4.4% zinc and 500 g/t silver.

MIM committed to undertake a US$17 million feasibility study on its George Fisher (formerly Hilton North) deposit. The exploration, metallurgical and mine design work is expected to be completed in early 1997. The deposit, located 22 km north of Mt. Isa, has an indicated reserve of 68 Mt grading 12.5% zinc, 5.8% lead and 92 g/t silver.

Pasminco Ltd. plans to mine its Potosi deposit near Broken Hill, New South Wales, starting in early 1996. The open-pit mine would produce 3500 t/y of lead in concentrate to supplement Broken Hill's underground operations. Potosi has a reserve of 1.1 Mt grading 9% zinc and 2% lead. Pasminco also plans to complete an environmental upgrade at its Cockle Creek ISF lead-zinc smelter, which will also increase its refined lead capacity by 13 000 t to 48 000 t/y.

Western Metals Ltd. opened its Goongewa zinc-lead mine in the Kimberley region of Western Australia to replace its exhausted Cadjebut mine with no net increase in capacity. The company also plans to develop its nearby Kapok and Blendvale zinc-lead deposits for production in mid-1997 and 1998 respectively.

Glencore International AG undertook a feasibility study on modernization and rationalization of the Dalpolymetal lead-zinc mine complex near Vladivostok in Russia. The company was expected to decide by the end of January 1996 whether to proceed with the project in which it owns a majority interest.

In Kazakstan, the Achisai and Karagaylinskoye mines closed, representing a total loss of about 56 000 t/y of lead in concentrate.

In China, the state-owned Shaoguan ISF smelter in Guangdong Province is scheduled to complete a 30 000-t/y expansion by 1996. The installation of a second plant will raise its capacity to 70 000 t/y of refined lead.

Americas

In the United States, ASARCO Incorporated received a reprieve at year-end from the Nebraska Department of Environmental Quality to allow full production to continue until at least June 1, 1996, at its Omaha lead refinery. Meanwhile, the company is examining the possibility of relocating the refinery, which has a capacity of 164 000 t/y of lead, to a new location in the Omaha area. In Montana, ASARCO is seeking a stay in the State's clean air regulations in order to continue to refine bullion from its East Helena lead smelter until the end of 1996.

Cominco increased reserves at its Red Dog mine in Alaska by 70% with the discovery of a new orebody next to the existing operations. The new deposit is amenable to open-pit mining and contains at least 65 Mt grading 14% zinc and 3% lead. Cominco is examining the feasibility of expanding the mining rate at Red Dog by 30%. Such an expansion would have to be approved by the local native-owned NANA Regional Corporation, which leases the Red Dog property to Cominco.

Kennecott Minerals Company, a subsidiary of RTZ Corporation PLC, has decided to restart production at its Greens Creek underground polymetallic mine in Alaska in early 1997. The mine closed in 1993 due to low metal prices. Subsequent drilling discovered a new higher-grade orebody comprising 2 Mt grading 13% zinc, 6% lead, 1166 g/t silver and 9.3 g/t gold. Upon re-opening, the mine would produce 17 000 t/y of lead in concentrate.

The U.S. Defense Logistics Agency sold 36 000 t of lead from its strategic stockpile in fiscal year 1995 which ended September 30, 1995. The amount authorized for sale had been 54 000 t in fiscal year 1995, and the same amount is authorized for fiscal year 1996.

Plumbum SA Mineracao e Metalurgia closed its Panelas lead smelter and refinery in Brazil at the end of November due to difficulty in sourcing imported concentrates after local mines became exhausted. The refinery had a capacity of 30 000 t/y of refined lead. The Panelas plant was Brazil's only primary lead facility. Brazil plans to import lead metal to augment a small amount of domestic secondary production in order to meet demand from Brazilian battery manufacturers.

In Bolivia, Plumbum plans to re-open the Toropalca underground lead-zinc mine in the Potosi region in 1996. The mine would produce 20 000 t/y of lead in concentrate. The company is also considering the installation of a redundant Brazilian lead smelter at the site.

Approval for development of the Iscaycruz zinc-lead mine in Peru was given in April. Partners Glencore (75%) and Minero Peru S.A. plan to commence production at the end of March 1996. When at full production, the mine will produce 5000 t/y of lead in concentrate.

Europe

Metaleurop S.A. continued construction of its new 90 000-t/y capacity Isasmelt lead smelter to replace its conventional smelter at Nordenham, Germany. Its smelter capacity will decrease by 5000 t/y, but refinery capacity will remain unchanged at 120 000 t/y of lead when the new smelter opens in early 1996. The new smelter will be able to treat a greater proportion of secondary material.

Ivernia West Plc submitted a planning application in early January 1996 for its Lisheen project in County Tipperary, Ireland. Ivernia West hopes to bring Lisheen on stream in 1998. At full capacity the mine would produce 25 000 t/y of lead in concentrate.

Also in Ireland, ARCON International Resources Plc began construction of its US$23 million Galmoy mine in County Kilkenny at the end of March after receiving a state mining licence in February. Start-up is scheduled for the end of August 1996. At full capacity the mine would mill 1800 t/d of ore to produce 6000 t/y of lead in concentrate. Current reserves at Galmoy will support a 10-year operation with the potential for further reserves considered to be excellent.

Andaluza de Piritas S.A. plans to develop the Los Frailes polymetallic deposit in Spain. Los Frailes is located one kilometre from the company's Aznalcollar mine, which will be depleted at the end of 1996. When in full production in 1997 the new mine will produce 40 000 t/y of lead in concentrate, an increase of 20 000 t/y over production at Aznalcollar.

TVX Gold Inc. of Canada acquired the Kassandra Mines of Ethniki Kephaleou S.A. in Greece. These include the Stratonio and Olympias lead-zinc mines which produce 26 000 t/y of lead in concentrate, a mill with capacity to treat 1.1 Mt/y of ore, and ship-loading facilities. Modernization of the mines, installation of a gold extraction process and environmental rehabilitation will cost TVX $180 million over three years.

Britannia Refined Metals Ltd. completed a 10 000-t/y expansion at its Northfleet lead refinery in the United Kingdom. The expansion raises its capacity to 240 000 t/y of refined lead.

Africa

Gold Fields Namibia Ltd. plans to replace one of the blast furnaces at its Tsumeb lead smelter in Namibia with Australian Ausmelt technology. The upgrade would allow greater use of secondary material to replace concentrates lost with the imminent closure of the Tsumeb mine. The retreatment of tailings in the modified Tsumeb concentrator is currently under way.

In Morocco, Société Minière de Djebel Aouam plans to re-open its Djebel Aouam zinc-lead-silver mine in 1996. The mine, which closed in 1993, would produce 13 000 t/y of lead in concentrate.

Secondary Production/Recycling

Lead is one of the most recycled nonferrous metals in the world. The secondary production of lead (from recycled materials) has risen steadily and surpassed primary output for the first time in 1989 (Figure 1). This growth reflects the favourable economic conditions associated with lead recycling and the fact that lead retains its physical and chemical properties when recycled. As lead is used worldwide, scrap lead has become a readily renewable resource to which countries without lead mines have access.

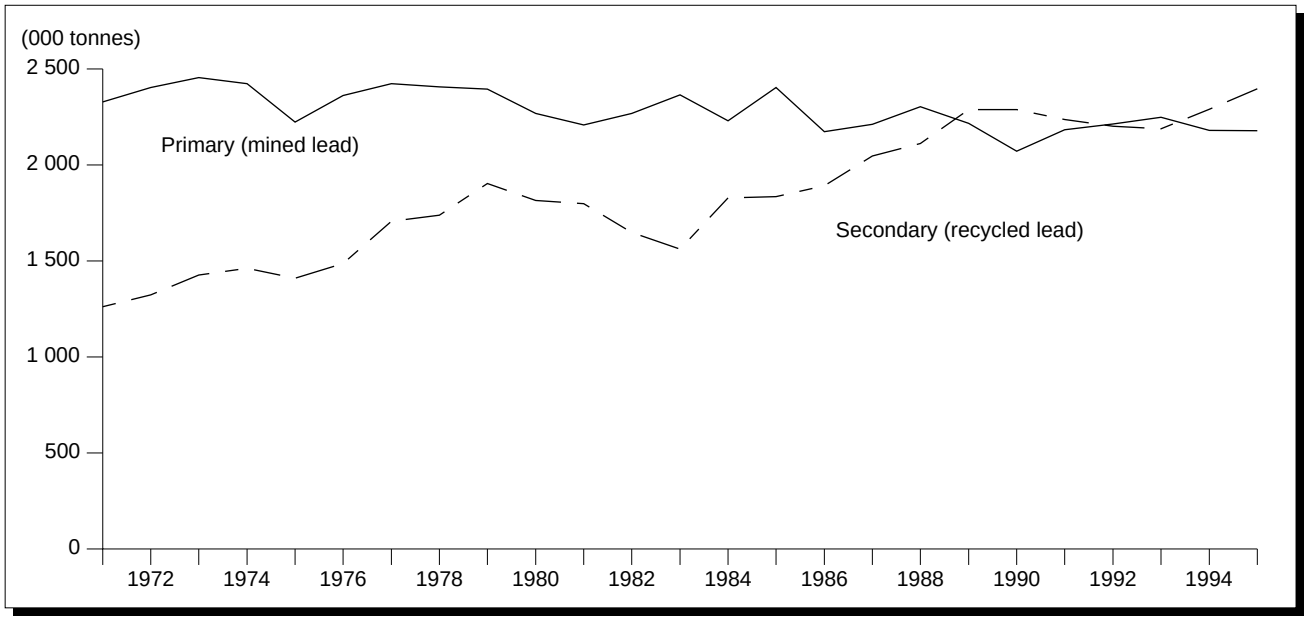
According to the Battery Council International, the recycling rate for lead-acid batteries in the United States was 98.2% in 1994 compared to 92.9% in 1993. This rate was the highest among scrap materials for the eighth consecutive year. The success in battery recycling can be attributed in large part to the extensive distribution infrastructure in place in the battery industry, which facilitates recycling.

In the United States, GNB Inc. opened its new 90 000-t/y secondary lead smelter in Columbus, Georgia, in mid-1995. The smelter replaces an earlier plant that had a capacity of 20 000 t/y of refined lead.

Also in the United States, RSR Corporation is planning to spend US$25 million to expand lead capacity at its secondary smelters in Indianapolis, Indiana, and Middleton, New York. At the Indiana plant, installation of a second electric furnace will expand capacity by 24 000 t/y to 134 000 t/y of refined lead. A 24 000-t/y expansion is also under way at the New York plant to bring capacity to 95 000 t/y of refined lead. Both expansions are scheduled to come on stream in 1996.

Shanghai Jingao Chemical Industry and its Japanese partners began construction of a 12 000-t/y secondary lead smelter in China. The smelter, located in Shanghai, will also have a capacity to produce 10 000 t/y of lead oxide when it opens in 1996. Lead oxide will be shipped to Japan for use in the manufacture of glass for cathode ray tubes. Meanwhile, the state-owned Shaoguan lead smelter is installing a second furnace to raise its capacity from 40 000 t/y to 70 000 t/y of refined lead.

Figure 1
World Lead Metal Production,[1] 1971-95



Source: International Lead and Zinc Study Group.
[1] Excludes Eastern European and socialist countries.

National Lead Smelting Co. Ltd. opened its 18 000-t/y secondary lead smelter in Riiyadh, Saudi Arabia, in mid-1995. The smelter will utilize local battery scrap.

In Japan, Kamioka Mining and Smelting Co. Ltd. switched its 34 000-t/y lead smelter/refinery in Gifu prefecture from primary to secondary feed with no change in capacity. A similar switch is planned for 1996 by Hosokura Smelting Co. Ltd. at its 22 000-t/y lead smelter/refinery in Miyagi prefecture.

Union Minière SA plans to invest US$151 million to build a new Isasmelt lead smelter at its Hoboken plant in Belgium. When the new smelter comes on stream in 1998, it will have a capacity to produce 60 000-70 000 t/y of refined lead, mostly from secondary materials.

Quexco International, which owns RSR, the large secondary lead producer in the United States, increased its share of European smelting capacity by purchasing Metallgesellschaft AG's interest in one primary and four secondary lead smelters in Europe and one secondary facility in the Middle East. The six facilities represent a total lead smelting capacity of about 230 000 t/y. In 1993, Quexco acquired lead recycling and fabrication facilities in the United Kingdom and France.

Other planned secondary smelter projects in Poland, Romania, Russia and Malaysia were expected to supply an additional 66 000 t/y of refined lead capacity in 1996.

CONSUMPTION AND USES

On the basis of statistics from the ILZSG, Western World lead consumption rose to a record level of 4 866 000 t in 1995, a 2.5% increase from the 1994 level.

In Japan, demand declined for the fourth consecutive year, a drop of 4.6% from 1994. In contrast, Europe and the Republic of Korea boasted the strongest growth of 5% and 13%, respectively. Europe and the United States accounted for 38% and 31% of Western World lead demand, while Japan consumed 7%. Asia continues to display the strongest growth with the Republic of Korea now accounting for 5.5% of Western World demand.

Lead is a dense, bluish-white metal whose physical and chemical properties find application in a variety of uses in the manufacturing, construction and chemical industries.

Lead-acid batteries constitute the largest market for lead, representing about 68% of total usage in the Western World in 1994. In the United States, battery manufacturing constituted about 84% of total lead demand in 1994. The largest market for batteries, representing about 80% of lead used in the industry, is the automotive sector. The average automobile battery contains about 10 kg of lead. Some factors that influence lead demand in the automotive sector are new vehicle production, trends and age in vehicle population, and climatic conditions. In 1994, extremely cold winter temperatures and a hot summer reduced battery life and contributed to a surge in replacement battery demand in North America. The replacement battery market remained strong during 1995 as similar extreme climatic conditions developed in Europe, Japan, and again in parts of North America.

A potential growth area for the lead-acid battery is in energy storage facilities for utilities. These are designed to supplement existing generators during the peak morning and evening hours without drawing on other sources or building new power plants. In addition, the growth in cellular telephone networks has increased the demand for lead-acid batteries for stand-by power applications in the telecommunications industry.

Electric cars may provide the greatest future growth in demand for lead-acid batteries. In 1990, California approved stringent automobile emission standards that will require, by 1998, 2% of all new cars sold in the state to be zero emission or electric powered, with the figure increasing to 10% by the year 2003. It has been estimated that this would amount to 40 000 electric vehicles by 1998. It was reported that similar requirements may also be adopted by 10 eastern states which, when combined with California, account for one third of the total U.S. new car and light truck market. Furthermore, it was estimated that if every state followed California's lead, then 1.7 million electric vehicles might be required by 2003. The "Big Three" automobile producers (General Motors Corp., Ford Motor Corp. and Chrysler Corp.) are experimenting with different battery prototypes but are concerned that electric vehicles will not be commercially viable before the year 2000. With respect to environmental concerns, the U.S. Environmental Protection Agency is reportedly concerned that the increase in energy requirements for electric vehicles could result in greater pollution in areas where power plants are fuelled by coal and oil.

This new demand for lead will also increase the incentive to develop a longer-lasting, more efficient and cost-competitive substitute for the lead-acid battery. General Motors Corp.'s "Impact" electric car is currently powered by a lead-acid battery. However, the company has also entered into an agreement with Energy Conversion Devices Inc. to develop a nickel-metal hydride battery. Nissan is developing a future electric vehicle to be powered by a nickel-cadmium battery that is expected to achieve full charge in 15 minutes. Isuzu Motors Ltd. and Fuji Electrochemical Co., Ltd. expect to market a new revolutionary battery made of activated carbon and diluted sulphuric acid that recharges faster and produces more power

than conventional batteries. Also competing are Kansai Electric Power Co., Inc. and Japan Storage Battery Co., Ltd., who are developing a new nickel-zinc battery. Other candidates include a zinc-based slurry developed by Luz International that generates energy when combined with oxygen and which can be recharged in minutes by adding fresh slurry. There is also the Australian-designed vanadium redox battery that is reported to be recyclable, more efficient, longer lasting, and which requires one eighth the time to recharge compared to a lead-acid cell. The Canada Centre for Mineral and Energy Technology (CANMET) of Natural Resources Canada is participating with industry in the development of a lithium-aluminum-iron sulphide battery and a sodium-sulphur battery.

Some experts believe that the lead-acid battery is the only technology that can be counted on to meet new electric vehicle demand in the short-to-medium term. Compared with other battery systems, these batteries are easily recycled, relatively inexpensive and considered to be free from safety concerns.

In March 1992, an Advanced Lead-Acid Battery Consortium was formed to develop an improved lead-acid battery for the electric vehicle. The consortium currently has 37 members representing lead producers, battery companies, and an automotive manufacturer. The membership is from 11 countries and Canadian sponsors are Cominco and Noranda.

The “Horizon” lead-acid battery produced by Electrosource Inc. and BDM Technology Inc. is reported to be one of the most promising new technological developments. The battery has plates made of lead wire co-extruded in a woven pattern on a fibreglass core. It is therefore lighter than traditional batteries with lead cast plates and reportedly lasts three times longer, can be recharged in minutes, and offers more power. Chrysler Corp. recently awarded a purchase order worth a potential US$80 million to Electrosource for lead-acid batteries to be used in Chrysler's planned line of electric minivans to be built in Windsor, Ontario. Meanwhile, General Motors plans to sell electric cars utilizing lead-acid batteries on the U.S. market in 1996.

Hyundai Electronics Industries has developed a new, sealed, rechargeable lead-acid battery for use in personal computers and cellular phones. The new battery has the same capacity as nickel-cadmium batteries but is cheaper.

The second largest use of lead is in pigments and compounds, accounting for 11% of Western World demand in 1994. The principal uses are in PVC stabilizers, which prevent degradation during processing or from ultraviolet radiation; colour pigments; and the manufacture of glass, including crystal, light bulbs, insulators and television/computer screens. While lead is still used for some specific paint applications, its general use in this application has declined significantly due to the potential risk involved in exposure to weathered or flaked paint.

Until the mid-1970s, the production of lead additives for gasoline, including tetraethyl lead, constituted one of the most important markets for the metal. However, with the adoption of environmental regulations that have either prohibited or severely restricted the use of such additives, the demand for lead in this application has declined dramatically. In Canada, lead was eliminated, through legislation, as an additive in gasoline for general consumption at the end of 1990.

Lead is alloyed with tin in the production of solder used in both the electronics and plumbing sectors. In the plumbing industry, the demand for lead has fallen primarily as a result of the increasing use of plastic piping. Where metal systems are still used for potable water systems, new regulations that have been adopted or are being considered will reduce the amount of lead in solder. In the electronics field, the move to miniaturization, combined with the replacement of printed circuit boards, has also reduced the demand for lead in solder.

Lead is also used with tin in foil for wine bottle capsules. However, this practice has been phased out in many countries because of environmental and health concerns. The European Community banned the use of tin-lead capsules effective January 1, 1993. Aluminum, plastics (PVC) and tin-based products have been used to replace lead foil.

Other important applications of both lead metal and lead alloys include: in the production of free machining steel and brass, rolled sheet and strip for roofing applications, power and communication cable sheathing, especially for underground or submarine environments, and as a sound barrier material in construction.

Lead possesses excellent sound and radiation attenuation properties. In addition, it is also highly corrosion-resistant. For these reasons, lead is the preferred metal for shielding around X-ray equipment and at nuclear installations. In these applications lead is used either alone or in the form of sheets bonded to plywood, steel or other material for shielding X-ray rooms, small isotope containers, enclosures containing noise sources, and linings for reaction vessels and laboratory surfaces.

Potential new uses for lead include: nuclear waste disposal applications; liquid metal for magnetohydrodynamics, a method of generating electricity by passing an electrically conducting fluid through a magnetic field; additives to extend the life of asphalt; barriers or shields against radon gas and electromagnetic fields; and as a damper to protect buildings from vibrations during earthquakes.

MARKETS, PRICES AND STOCKS

During 1995, the LME price for lead hovered in the US26¢-28¢/lb range for most of the year as the supply deficit that emerged in the second half of 1994 because of strong demand and a shortage of raw materials continued throughout 1995.

Although mine capacity increased in 1995 as new and recommissioned mines came on stream, there was a net loss in smelting and refining capacity due to closures and cutbacks that were, in part, a result of concentrate shortages created by labour disputes or production difficulties at some existing operations. The resulting marginal increase in metal production during 1995 was outstripped by expanding demand, particularly in the replacement battery market during the latter part of the year. The price for lead rose steadily in the fourth quarter to peak at 35.1¢/lb in November before settling to 32.6¢/lb by year-end. The average price for lead on the LME for 1995 was 28.6¢/lb, the highest annual average price since 1990 when it averaged 37.1¢/lb.

At the end of 1994, total lead stocks stood at 624 000 t, including 343 000 t on the LME. With reduced exports from the former Soviet Union and China, LME stocks steadily declined to a year-end low of 132 000 t, the lowest level recorded since January 1992. Preliminary ILZSG figures also indicate that producer stocks were essentially unchanged while consumer stocks grew about 10% in 1995. Total lead stocks stood at 441 000 t at the end of 1995.

INTERNATIONAL ORGANIZATIONS

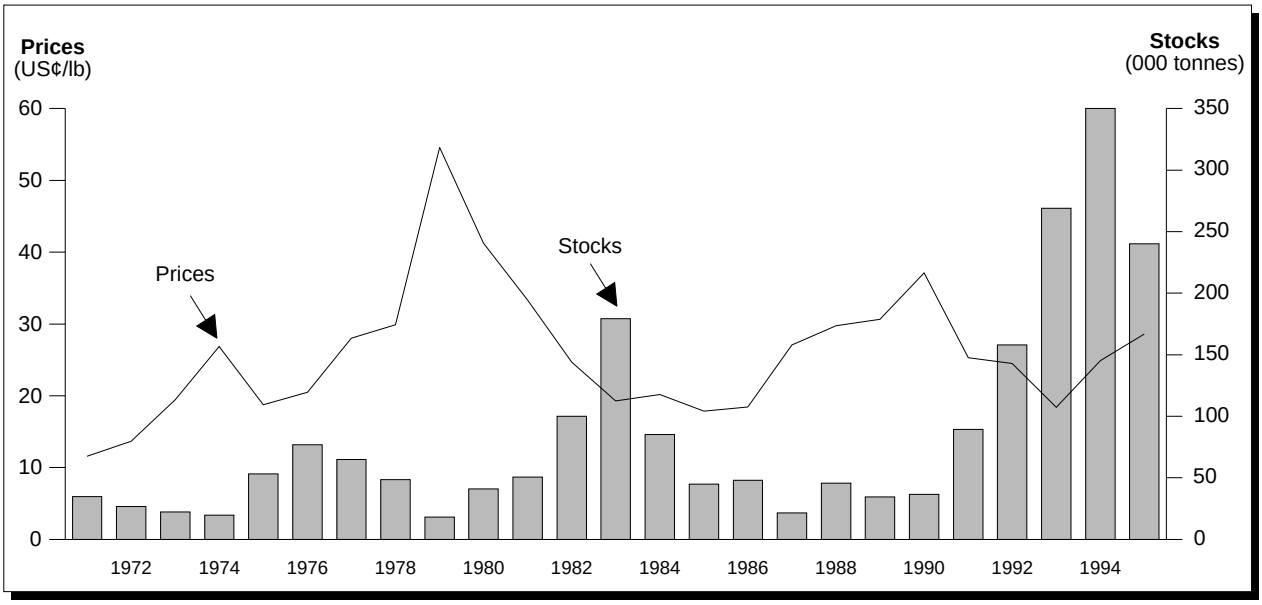
The International Lead and Zinc Study Group was formed in 1959 to improve market information and to provide opportunities for regular intergovernmental consultations on lead and zinc markets. Particular attention is given to providing regular and frequent information on supply and demand and on the outlook for lead and zinc. The Study Group is headquartered in London, England. Its membership includes most major lead and zinc producing and consuming countries.

The 40th Session of the Study Group was held in Geneva, Switzerland, in October 1995 and was attended by representatives of 28 member countries as well as observers from several nations and organizations. The 1995 session examined statistical trends, current new mine and smelter projects, trade patterns, changes to the U.S. Strategic Stockpile, as well as certain environmental issues. The recent Basel Decision to ban exports of hazardous wastes destined for recycling from OECD to non-OECD countries and the OECD Risk Reduction Program for Lead were major topics of discussion.

HEALTH, SAFETY AND THE ENVIRONMENT

The Organization for Economic Co-operation and Development (OECD) published *Risk Reduction Monograph No. 1: Lead* in 1993, which documents

Figure 2
Lead Prices[1] and Stocks,[2] 1971-95



Source: International Lead and Zinc Study Group.
[1] Annual average London Metal Exchange (LME) prices. [2] Annual average of LME month-end stocks.

lead's commercial life cycle, exposure, releases and control mechanisms in place in various OECD countries. The report revealed lead's high recycling rate (over 50% of refined lead production is derived from scrap). The document also shows how lead is being used more than ever before, while the levels of lead in air, food and blood in the general population have declined to below national levels of concern in all countries that monitor lead in the environment. Declines in exposure are in part a result of the phase-out of uses of lead that posed a concern, while the overall increase in lead consumption reflects strong demand for batteries and other beneficial uses.

In September 1994, Canada hosted an OECD Workshop on Lead Products as part of a process to determine if there are concerns that require international solutions. Approximately 200 experts from 14 countries participated in the workshop in Toronto and agreed that most concerns were not transboundary or international in nature and, for those that were, they could be resolved through national, regional or bilateral initiatives or through existing international institutions (e.g., International Standards Organization).

In February 1996, OECD Environment Ministers adopted a Ministerial Declaration for lead that recognizes the value of voluntary industry initiatives to reduce risks from exposure to lead. The Declaration also calls on OECD countries to take action, if it is considered necessary, and provides examples of possible exposures that could be considered for action depending on national circumstances.

The European Union ratified the Basel Convention during 1994. This United Nations (UN) convention restricts the transboundary movement of "hazardous waste" when destined for either final disposal or recycling operations. The Basel definition of wastes includes all recyclable materials. In 1995, the Basel Convention adopted a "ban" decision that prohibits the movement of hazardous wastes from OECD countries to non-OECD countries when destined for final disposal. This "ban" decision will also prohibit the movement of hazardous wastes from OECD countries to non-OECD countries when destined for recovery operations effective December 31, 1997. Recyclable lead materials (spent batteries, etc.) are currently classified internationally as wastes and, if lead is considered hazardous by national definitions, could be subject to strict transboundary movement controls or bans.

OUTLOOK

The supply deficit that prevailed in 1995 is expected to continue through 1996 until recommissioned mines return to full production and new mines come on stream. Western World lead consumption grew by about 1.4% in 1995, with an equivalent increase expected in 1996. Demand is forecast to remain steady in North America and Europe as economies continue to recover from the recession. However, metal supply will probably be unable to meet demand because of a continued tightness in the concentrate market. Concentrate shortages, combined with expanding domestic demand in China and the former Soviet Union, could result in a further decline in exports to the Western World. Producer inventories are at historical lows and LME stocks are predicted to continue to be drawn down.

The average LME price of lead was US28.6¢/lb in 1995. As inventories continue to fall, the price is expected to range between 30¢ and 38¢lb in 1996 with the potential to rise quickly, similar to the 60¢/lb spike in 1992, if there are substantial disruptions in supply.

It is believed that hot summers and cold winters in Europe, North America and Japan during the last few years have shortened the life of four- to six-year-old batteries, thereby increasing replacement battery demand. This premature increase in the turn-over rate for batteries may result in fewer replacement battery units and a corresponding reduction in lead demand during the next few years.

In the long term, lead demand is anticipated to maintain an average growth rate of about 1%/y into the early part of the next century. The battery sector will account for most of the growth with the newly industrialized nations of Southeast Asia expected to record the most rapid growth. The newly developing electrical vehicle market may further increase demand for lead, especially if governments adopt legislation, similar to California's, that requires a portion of new vehicles sold to be exhaust-free. Offsetting these bullish influences is the potential for legislative controls on the use of lead including, perhaps, non-dissipative uses that pose little direct danger of exposure.

It is expected that greater secondary output and primary production (from new and re-opened mines) will likely surpass demand and place downward pressure on prices in the medium to long term. The price of lead is forecast to range, in constant dollars, between 24¢ and 30¢/lb early in the next century, or possibly sooner if demand softens.

Canadian mine output is expected to grow in 1996 to 280 000 t as some mines re-open or return to normal production levels. In the long term, production will continue to rise as new mines come on stream. However, output may fall early in the next century if depleted reserves are not replaced.

Notes: (1) For definitions and valuation of mineral production, shipments and trade, please refer to Chapter 70. (2) Information in this review was current as of January 15, 1996.

TARIFFS

Item No.	Description	Canada MFN	Canada GPT	Canada USA	United States Canada[1]	EU MFN	Japan[1] MFN
2607.00	Lead ores and concentrates	Free	Free	Free	0.5¢/kg on Pb	Free	Free
78.01	Unwrought lead						
7801.10	Refined lead						
7801.10.10	Pig and block	Free	Free	Free	0.6% on Pb	3.0%	6.94 yen/kg
7801.10.90	Other	3.1%	Free	2.0%	0.6% on Pb	3.0%	6.94 yen/kg
7801.91	Containing by weight antimony as the principal other element						
7801.91.10	Lead-antimony-tin alloys	3.1%	Free	1.3%	0.6% on Pb	3.0%	5.8%
7801.91.90	Other	3.1%	Free	2.0%	0.6% on Pb	3.0%	5.8%
7801.99	Other						
7801.99.10	For refining, containing 0.02% or more by weight of silver (bullion lead)	3.1%	Free	2.0%	0.7% on Pb	Free	4.4%
7801.99.20	Lead alloys	3.1%	Free	2.0%	0.6% on Pb	3.0%	4.4%
7801.99.90	Other	3.1%	Free	2.0%	0.6% on Pb	3.0%	6.94 yen/kg
7802.00	Lead waste and scrap	Free	Free	Free	Free	Free	3.0%
7803.00	Lead bars, rods, profiles and wire						
7803.00.10	Bars and rods, not alloyed	3.5%	1.0%	0.8%	0.2%	7.4%	5.2%
7803.00.20	Bars and rods, of lead-antimony-tin alloys	5.3%	Free	1.3%	0.2%	7.4%	5.2%
7803.00.30	Bars and rods, of other alloys; profiles and wire	7.3%	Free	2.0%	0.2%	7.4%	5.2%
7804.20	Powders and flakes						
7804.20.10	Powders, not alloyed	3.5%	Free	0.8%	2.2%	1.8%	5.8%
7804.20.20	Alloyed powders; flakes	7.3%	Free	2.0%	2.2%	1.8%	5.8%

Sources: Customs Tariff, effective January 1996, Revenue Canada; Harmonized Tariff Schedule of the United States 1996; The Bulletin International des Douanes," Journal Number 14 (17th edition), European Union, 1994-95, "Conventional" column; Customs Tariff Schedules of Japan, 1995.
[1] GATT rate is shown; lower tariff rates may apply circumstantially.

TABLE 1. CANADA, LEAD PRODUCTION AND TRADE, 1994 AND 1995, AND CONSUMPTION, 1993 AND 1994

Item No.		1994 (tonnes)	1994 ($000)	1995[p] (tonnes)	1995[p] ($000)
SHIPMENTS[1]					
	Newfoundland	–	–	–	–
	Prince Edward Island	–	–	–	–
	Nova Scotia	–	–	–	–
	New Brunswick	76 019	56 862	85 105	72 340
	Quebec	–	–	–	–
	Ontario	–	–	–	–
	Manitoba	422	316	–	–
	Saskatchewan	–	–	–	–
	Alberta	–	–	–	–
	British Columbia	57 017	42 649	59 403	50 492
	Yukon	–	–	27 000	22 950
	Northwest Territories	34 126	25 527	31 542	26 811
	Total	167 584	125 353	203 050	172 592
	Mine output[2]	170 909	. .	212 147	. .
	Refined production				
	Primary	153 035	. .	181 786	. .
	Secondary	98 605	. .	103 849	. .
	Total	251 640	. .	285 635	. .
EXPORTS					
2607.00	Lead ores and concentrates				
	South Korea	–	–	27 287	13 860
	Germany	29 275	17 072	16 187	10 901
	Sweden	–	–	10 565	9 100
	Australia	–	–	11 946	6 483
	Japan	–	–	5 203	1 848
	Belgium	1 394	920	2 085	1 796
	United States	136	14 391	1 792	1 228
	Netherlands	–	–	1 832	1 209
	Other countries	4 339	2 797	3 835	2 611
	Total	35 144	35 180	80 732	49 036

TABLE 1 (cont'd)

Item No.		1994		1995p	
		(tonnes)	($000)	(tonnes)	($000)
EXPORTS (cont'd)					
2607.00.20	Lead content of lead ores and concentrates	35 131	20 842	71 388	39 840
2603.00.20	Lead content of copper ores and concentrates	967	209	230	148
2608.00.20	Lead content of zinc ores and concentrates	19 661	6 191	43 781	13 889
2616.10.20	Lead content of silver ores and concentrates	163	55	–	–
7801.10	Refined lead, unwrought				
	United States	119 079	91 974	124 615	112 790
	Malaysia	1 139	835	5 003	4 224
	Thailand	3 007	1 899	2 168	1 768
	Philippines	1 884	973	1 991	1 537
	United Kingdom	–	–	1 578	1 383
	Indonesia	1 508	826	1 200	1 056
	Other countries	5 652	3 131	2 955	2 180
	Total	132 269	99 638	139 510	124 938
7801.91	Lead, unwrought, containing by weight antimony as the principal other element	9 920	8 333	11 266	10 900
7801.99	Lead, unwrought, n.e.s.	35 760	31 511	58 130	57 568
7802.00	Lead waste and scrap				
	United States	6 343	2 836	7 783	3 842
	South Korea	–	–	69	55
	India	19	5	20	5
	Total	6 362	2 841	7 872	3 902
7803.00	Lead bars, rods, profiles and wire				
	United States	505	1 055	633	1 180
	Singapore	11	15	5	13
	Cuba	1	2	–	–
	Total	517	1 072	638	1 193
EXPORTS (cont'd)					
7804.11	Lead sheets, strip and foil of a thickness (excluding any backing) <0.2 mm	211	302	220	367
7804.19	Lead plates, sheet, strip and foil, n.e.s.	37	50	99	161
7804.20	Lead powders and flakes	169	542	–	–
7805.00	Lead tubes, pipes and tube or pipe fittings (i.e., couplings, elbows, sleeves)	11	27	5	21
7806.00	Other articles of lead, n.e.s.				
	United States	..	3 679	..	4 562
	South Korea	..	–	..	31
	Singapore	–	–	..	25
	Belgium	..	3	..	7
	Bermuda	..	1	..	3
	Australia	..	4	..	3
	Other countries	..	49	–	–
	Total	..	3 736	..	4 631
IMPORTS[3]					
2607.00	Lead ores and concentrates				
	United States	9 017	5 025	20 565	11 642
	Peru	5 564	8 836	7 952	7 475
	Mexico	–	–	2 608	3 551
	Morocco	–	–	4 171	3 283
	South Africa	11 955	7 082	4 396	2 784
	Chile	86	52	3 672	2 756
	Total	26 622	20 995	43 364	31 491
2607.00.00.20	Lead content of lead ores and concentrates	25 776	15 755	43 335	26 267
2603.00.00.20	Lead content of copper ores and concentrates	303	225	113	35
2608.00.00.20	Lead content of zinc ores and concentrates	9 825	10 292	12 692	12 944
2616.10.00.20	Lead content of silver ores and concentrates	4 857	2 710	10 969	6 524

TABLE 1 (cont'd)

Item No.		1994		1995[p]	
		(tonnes)	($000)	(tonnes)	($000)
IMPORTS[3] (cont'd)					
7801.10.10	Refined lead, unwrought, pig and block	4 315	3 218	3 115	2 789
7801.10.90	Refined lead, unwrought, other	152	314	128	129
7801.91	Lead, unwrought, containing by weight antimony as the principal other element	492	415	844	762
7801.99	Lead, unwrought, n.e.s.	1 418	1 219	781	777
7802.00	Lead waste and scrap				
	United States	67 914	15 192	95 705	22 142
	Hong Kong	17	10	–	–
	Total	67 931	15 202	95 705	22 142
7803.00	Lead bars, rods, profiles and wire				
	United States	161	239	210	349
	Taiwan	31	50	18	29
	Germany	..	...	17	27
	Belgium	3	6	12	18
	Other countries	1	1	–	–
	Total	196	296	257	423
7804.11	Lead sheets, strip and foil of a thickness (excluding any backing) <0.2 mm	236	413	209	366
7804.19	Lead plates, sheet, strip and foil, n.e.s.	139	208	164	243
7804.20	Lead powders and flakes	79	114	101	155
7805.00	Lead tubes, pipe and tube or pipe fittings (i.e., couplings, elbows, sleeves)	19	37	9	15
7806.00	Other articles of lead				
	United States	..	3 822	..	4 437
	Japan	..	39	..	73
	Germany	..	51	..	50
	Mexico	–	–	..	21
	People's Republic of China	..	3	..	18
	Taiwan	..	11	..	9
	Other countries	..	34	..	20
	Total	..	3 960	..	4 628

	1993			1994		
	Primary	Secondary[5]	Total	Primary	Secondary[5]	Total
	(tonnes)					
CONSUMPTION[4]						
Lead used for, or in the production of:						
Antimonial lead	x	x	27 623	x	x	35 678
Batteries and battery oxides	22 171	12 933	35 104	24 342	11 794	36 136
Chemical uses; white lead, red lead, litharge, tetraethyl lead, etc.	x	x	14 434[r]	x	x	7 565
Copper alloys; brass, bronze, etc.	116	10[r]	126[r]	102	9	111
Lead alloys:						
Solders	1 324	961	2 285	596	1 720	2 316
Others (including babbitt, type metals, etc.)	2 394	1 834	4 228	1 476	4 269	5 745
Semi-finished products:						
Pipe, sheet, traps, bends, blocks for caulking, ammunition, etc.	1 761	849	2 609	1 638	1 224	2 862
Other lead products	3 542[r]	2 121	5 663[r]	3 860	1 579	5 440
Total, all categories	48 320[r]	43 752[r]	92 072[r]	42 946	52 908	95 854

Sources: Natural Resources Canada; Statistics Canada.
– Nil; .. Not available; [p] Preliminary; [r] Revised; x Confidential.
[1] Production includes recoverable lead in ores and concentrates shipped, valued at the average Montréal price for the year. [2] Lead content of domestic ores and concentrates exported. [3] Imports from "other countries" may include re-imports from Canada. [4] Available data, as reported by consumers. [5] Includes all remelt scrap lead used to make antimonial lead.
Note: Numbers may not add to totals due to rounding.

TABLE 2. CANADA, LEAD PRODUCTION, TRADE[1] AND CONSUMPTION, 1975, 1980 AND 1985-95

	Production				Exports[1]			Imports	Consumption[3]
		Refined							
	All Forms[2]	Primary	Secondary	Total	In Ores and Concentrates	Refined	Total	Refined	
					(tonnes)				
1975	349 133	171 516	. .	171 516	211 909	110 882	322 791	1 962[a]	89 192
1980	251 627	162 463	72 117	234 580	147 008	126 539	273 547	2 602[a]	106 836
1985	268 291	173 220	66 791	240 011	93 657	113 993	207 650	5 675[a]	104 447
1986	334 342	169 934	87 746	257 680	118 373	111 831	230 204	4 247[a]	94 680
1987	373 215	139 475	91 186	230 661	207 936	100 204	308 140	12 558[a]	97 281
1988	351 148	179 461	88 615	268 076	200 822	179 946	380 768	15 132	88 041
1989	268 887	157 330	85 515	242 845	170 568	121 444	292 012	11 708	87 715
1990	233 372	87 180	96 465	183 645	221 565	84 007	305 572	11 756	71 467
1991	248 102	106 420	105 946	212 366	175 150	86 631	261 781	7 553	79 555
1992	339 626	151 252	101 633	252 885	190 822	131 546	322 368	8 289	91 719
1993	183 105	147 907	69 107	217 014	96 428	124 610	221 038	11 612	89 141
1994	167 584	153 035	98 605	251 640	55 922	133 203	189 125	5 117	92 072
1995[p]	203 050	181 786	103 849	285 635	115 399	140 467	255 866	3 974	95 854

Sources: Natural Resources Canada; Statistics Canada.
. . Not available; [p] Preliminary.
[a] Lead in pigs, blocks and shot.
[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. Ores and concentrates include HS classes 2603.00.20, 2607.00.20, 2608.00.20 and 2616.10.20. Refined exports include HS classes 7801.10, 7803.00, 7804.11, 7804.19 and 7804.20. Refined imports include HS classes 7801.10.10.00, 7801.10.90.00, 7803.00, 7804.11, 7804.19 and 7804.20. [2] Recoverable lead in ores and concentrates shipped. [3] Consumption of lead, primary and secondary in origin, as measured by a survey of consumers.

TABLE 3. CANADA, LEAD SMELTING AND REFINING CAPACITY, 1995

Company and Location	Annual Rated Capacity	
	Smelting	Refining
	(000 t of refined lead)	
Cominco Ltd.[2] Trail, British Columbia	120	160
Metalex Products Ltd.[1] Burnaby, British Columbia	6	5
Canada Metal Company[1] Winnipeg, Manitoba	5	5
Canada Metal Company[1] Toronto, Ontario	12	12
Tonolli Canada Ltd.[1] Mississauga, Ontario	35	35
Nova Lead Inc.[1] Ville Ste-Catherine, Quebec	60	60
American Iron and Metal Co. (1969) Inc.[1] Montréal, Quebec	–	20
Fonderie Générale du Canada[1] Lachine, Quebec	–	3
Brunswick Mining and Smelting Corporation Limited[2] Belledune, New Brunswick	100	100
Total Canada	338	380

Source: Natural Resources Canada.
[1] Process lead-bearing scrap. [2] Process lead-bearing concentrate and scrap.

TABLE 4. AVERAGE ANNUAL LEAD PRICES, 1975-95

Year	London Metal Exchange			
	Settlement		Three Months	
	(£/t)	(US¢/lb)	(£/t)	(US¢/lb)
1975	185.23	18.755	186.78	18.821
1976	250.70	20.480	259.79	21.275
1977	354.11	28.022	359.12	28.433
1978	342.79	29.886	342.94	29.895
1979	567.66	54.574	542.66	52.161
1980	391.29	41.237	392.08	41.343
1981	363.37	33.327	370.93	34.025
1982	310.72	24.679	321.55	25.516
1983	279.97	19.290	290.62	19.983
1984	332.49	20.156	333.20	20.196
1985	304.01	17.876	304.03	17.877
1986	277.36	18.456	277.61	18.473
1987	363.66	27.098	346.40	25.736
1988	368.40	29.748	358.35	28.834
1989	412.39	30.669	406.41	29.908
1990	458.21	37.097	443.06	35.871
1991	315.23	25.303	325.84	25.805
1992	306.12	24.496	317.26	25.109
1993	274.40	18.128	274.87	18.728
1994	357.28	24.830	367.12	25.510
1995	399.80	28.620	405.04	28.997

Sources: London Metal Exchange; *Metals Week*.

TABLE 5. AVERAGE MONTHLY LEAD PRICES, 1994 AND 1995

	London Metal Exchange			
	Settlement		Three Months	
	(£/t)	(US¢/lb)	(£/t)	(US¢/lb)
1994				
January	328.17	22.21	336.37	22.79
February	327.93	22.00	336.81	22.60
March	302.38	20.46	311.77	21.10
April	296.53	19.94	305.96	20.58
May	314.46	21.46	326.17	22.24
June	343.86	23.79	355.30	24.57
July	374.82	26.30	384.21	26.96
August	369.84	25.87	381.37	26.67
September	391.53	27.81	400.21	28.41
October	399.29	29.10	407.19	29.69
November	419.57	30.25	429.85	31.00
December	406.66	28.75	418.01	29.56
1995				
January	423.22	30.24	433.53	30.97
February	368.70	26.30	380.12	27.12
March	365.84	26.56	374.45	27.17
April	378.22	27.60	385.20	28.10
May	375.65	27.06	383.81	27.64
June	383.63	27.75	391.34	28.32
July	389.94	28.21	398.06	28.80
August	397.60	28.29	406.71	28.92
September	380.61	26.89	388.49	27.45
October	404.85	28.99	404.73	28.96
November	456.69	32.37	448.67	31.81
December	475.27	33.19	467.82	32.69

Source: *Metals Week*.

TABLE 6. NON-SOCIALIST WORLD LEAD CONSUMPTION, 1991-94

	1991		1992		1993		1994	
	(000 t)	(%)	(000 t)	(%)	(000 t)	(%)	(000 t)	(%)
Batteries	2 566.1	63.8	2 590.5	64.8	2 609.7	65.7	2 923.6	68.4
Cable sheathing	164.9	4.1	147.2	3.7	137.9	3.5	126.2	3.0
Rolled and extruded products	285.8	7.1	273.2	6.8	264.4	6.7	271.1	6.3
Shot/ammunition	106.8	2.7	111.2	2.8	118.6	3.0	115.7	2.7
Alloys	130.9	3.3	137.2	3.4	136.8	3.4	141.5	3.3
Pigments and other compounds	544.8	13.5	535.8	13.4	492.8	12.4	485.3	11.4
Gasoline additives	74.0	1.8	58.1	1.5	55.3	1.4	53.1	1.2
Miscellaneous	149.9	3.7	146.7	3.7	155.0	3.9	158.7	3.7
Total	4 023.2	100.0	3 999.9	100.0	3 970.5	100.0	4 275.2	100.0

Source: International Lead and Zinc Study Group.
Note: Statistics are for Australia, Austria, Belgium, Brazil, Canada, Finland, France, Germany, India, Italy, Japan, the Republic of Korea, Mexico, the Netherlands, New Zealand, Scandinavia, South Africa, Southeast Asia, Spain, Switzerland, Thailand, the United Kingdom and the United States.

TABLE 7. REFINED LEAD CONSUMPTION BY COUNTRY, 1991-95

	1991	1992	1993	1994	1995p
			(000 t)		
AMERICAS					
Brazil	66	69	74	85	92
Canada	78	89	74	73	68
Mexico	133	164	157	161	133
United States	1 247	1 287	1 382	1 495	1 510
Other Americas	73	79	92	89	91
Total Americas	1 597	1 688	1 779	1 903	1 894
EUROPE					
Austria	67	66	62	64	65
Belgium	72	64	74	65	72
France	252	246	226	237	243
Germany	413	412	352	354	365
Italy	259	247	223	230	240
Netherlands	59	52	48	57	61
Poland	47	40	59	55	65
Russia	260	215	92	103	95
Spain	135	105	102	112	119
United Kingdom	264	264	264	268	285
Other Europe	303	238	208	220	233
Total Europe	2 131	1 949	1 711	1 765	1 843
ASIA					
China, People's Republic of	250	240	290	295	298
India	75	60	70	75	80
Indonesia	40	57	75	91	88
Iran	52	56	60	60	65
Japan	422	401	370	346	330
Korea, Republic of	159	177	201	233	263
Taiwan	83	109	117	121	128
Thailand	39	47	48	62	65
Other Asia	202	217	217	210	220
Total Asia	1 322	1 364	1 448	1 493	1 537
OCEANIA					
Australia	56	58	62	78	77
New Zealand	6	4	5	4	4
Total Oceania	62	62	67	82	81
AFRICA					
Algeria	19	18	18	18	19
Egypt	16	11	7	6	6
South Africa	56	54	59	59	57
Other Africa	23	28	24	27	25
Total Africa	114	111	108	110	107
Total Western World	4 483	4 517	4 507	4 767	4 866
Total World	5 226	5 174	5 113	5 353	5 462

Source: International Lead and Zinc Study Group.
p Preliminary.

TABLE 8. MINE PRODUCTION OF LEAD BY COUNTRY, 1991-95

	1991	1992	1993	1994	1995p
			(000 t)		
AMERICAS					
Canada	276	344	183	173	212
Mexico	165	170	141	170	175
Peru	218	214	225	227	232
United States	477	407	362	370	392
Other Americas	62	51	42	37	47
Total Americas	1 198	1 186	953	977	1 058
EUROPE					
Bulgaria	41	38	34	32	28
Greece	32	28	27	20	21
Ireland	40	43	45	54	46
Macedonia	32	22	23	20	20
Poland	47	51	49	52	51
Russia	42	46	34	25	23
Serbia	34	23	9	5	–
Spain	50	31	25	24	31
Sweden	87	106	104	113	101
Other Europe	57	46	32	38	39
Total Europe	462	434	382	383	360
ASIA					
China, People's Republic of	352	330	338	462	420
India	25	31	30	30	33
Iran	17	12	15	18	20
Japan	18	19	17	10	10
Kazakstan	144	130	104	53	58
Korea, D.P.R.	80	70	70	55	50
Thailand	17	13	5	7	8
Uzbekistan	31	30	30	18	18
Other Asia	30	32	20	15	18
Total Asia	714	667	632	668	635
OCEANIA					
Australia	579	575	521	486	437
AFRICA					
Morocco	71	72	79	70	68
South Africa	76	77	100	96	88
Zambia	10	6	8	–	–
Other Africa	24	22	19	24	29
Total Africa	181	177	206	190	185
Total Western World	2 375	2 322	2 013	1 985	2 008
Total World	3 134	3 039	2 694	2 704	2 675

Source: International Lead and Zinc Study Group.
– Nil; p Preliminary.

TABLE 9. REFINED LEAD PRODUCTION BY COUNTRY, 1991-95

	1991	1992	1993	1994	1995p
			(000 t)		
AMERICAS					
Brazil	64	63	67	64	50
Canada	212	253	220	252	286
Mexico	236	288	256	214	227
Peru	75	83	86	88	89
United States	1 195	1 182	1 196	1 232	1 263
Other Americas	46	50	47	47	45
Total Americas	1 828	1 919	1 872	1 897	1 960
EUROPE					
Belgium	99	99	112	123	122
Bulgaria	56	53	60	62	65
France	283	284	259	260	294
Germany	363	354	334	332	311
Italy	208	186	183	204	172
Poland	51	54	65	63	71
Russia	34	38	45	34	30
Spain	112	55	62	75	79
Sweden	88	91	82	83	83
United Kingdom	311	347	364	353	322
Other Europe	254	213	171	164	167
Total Europe	1 859	1 774	1 737	1 753	1 716
ASIA					
China, People's Republic of	296	366	412	468	421
India	48	53	51	65	59
Iran	38	42	52	51	55
Japan	332	330	309	292	287
Kazakstan	300	284	245	145	103
Korea, D.P.R.	65	65	65	50	50
Korea, Republic of	59	90	128	130	183
Taiwan	17	20	31	36	36
Other Asia	108	118	125	119	129
Total Asia	1 263	1 368	1 418	1 356	1 323
OCEANIA					
Australia	232	232	236	236	234
New Zealand	5	5	5	6	6
Total Oceania	237	237	241	242	240
AFRICA					
Morocco	73	71	72	64	62
Namibia	33	32	31	24	27
South Africa	32	29	32	32	32
Other Africa	15	14	13	10	11
Total Africa	153	146	148	130	132
Total Western World	4 443	4 508	4 465	4 505	4 575
Total World	5 340	5 444	5 416	5 378	5 371

Source: International Lead and Zinc Study Group.
p Preliminary.