

Iron Ore and Primary Iron

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SUMMARY

Worldwide production of steel increased in 1995, which led to higher demand for iron ore. The steel industries in developed countries continued the recovery that began in 1994, while Russia and the countries of central Europe posted significant increases in steel production after several years of decline following their democratization.

As expected, the revival of the steel industries in Western Europe and the United States, as well as the continued growth of steel output in China and other Far Eastern countries, pushed internationally traded iron ore to a new record of 434 Mt. The tight supply situation that had developed for iron ore pellets and lump ore in 1994 continued in 1995. The fines and concentrate market continued to be well supplied. Major iron ore producers and consumers had not completed price negotiations for 1996 by year-end 1995, but the consensus was that some increase would be posted for all grades of ore.

A large number of projects for direct reduced iron (DRI) and new technologies for iron-making and steel-making advanced in 1995 because of high prices for ferrous scrap and the development opportunity created by low-priced natural gas in the Pilbara region of Australia.

IRON ORE

Canadian Developments

There are three mining operations in the Labrador Trough area of northern Quebec and Labrador, and these account for over 96% of Canadian iron ore production. These mines belong to the Iron Ore Company of Canada (IOC), Quebec Cartier Mining

Company (QCM), and Wabush Mines. There are also one mine in Ontario, the Algoma Ore Division (AOD) of Algoma Steel Inc., and by-product recovery of magnetite from two base-metal smelters in British Columbia. Canadian iron ore production in 1995 increased by over one million tonnes to about 38.1 Mt. Although not included in the iron ore industry, QIT-Fer et Titane Inc. mines ilmenite, an iron-titanium ore, near Havre-St-Pierre, Quebec, and produces pig iron as a co-product of titanium slag.

Shipments of iron ore hit a low of 32 Mt (31.5 Mt on a dry basis) in 1992, recovered slightly in 1993, and then exceeded 37 Mt in each of 1994 and 1995. Shipments in 1996 are forecast to be even higher.

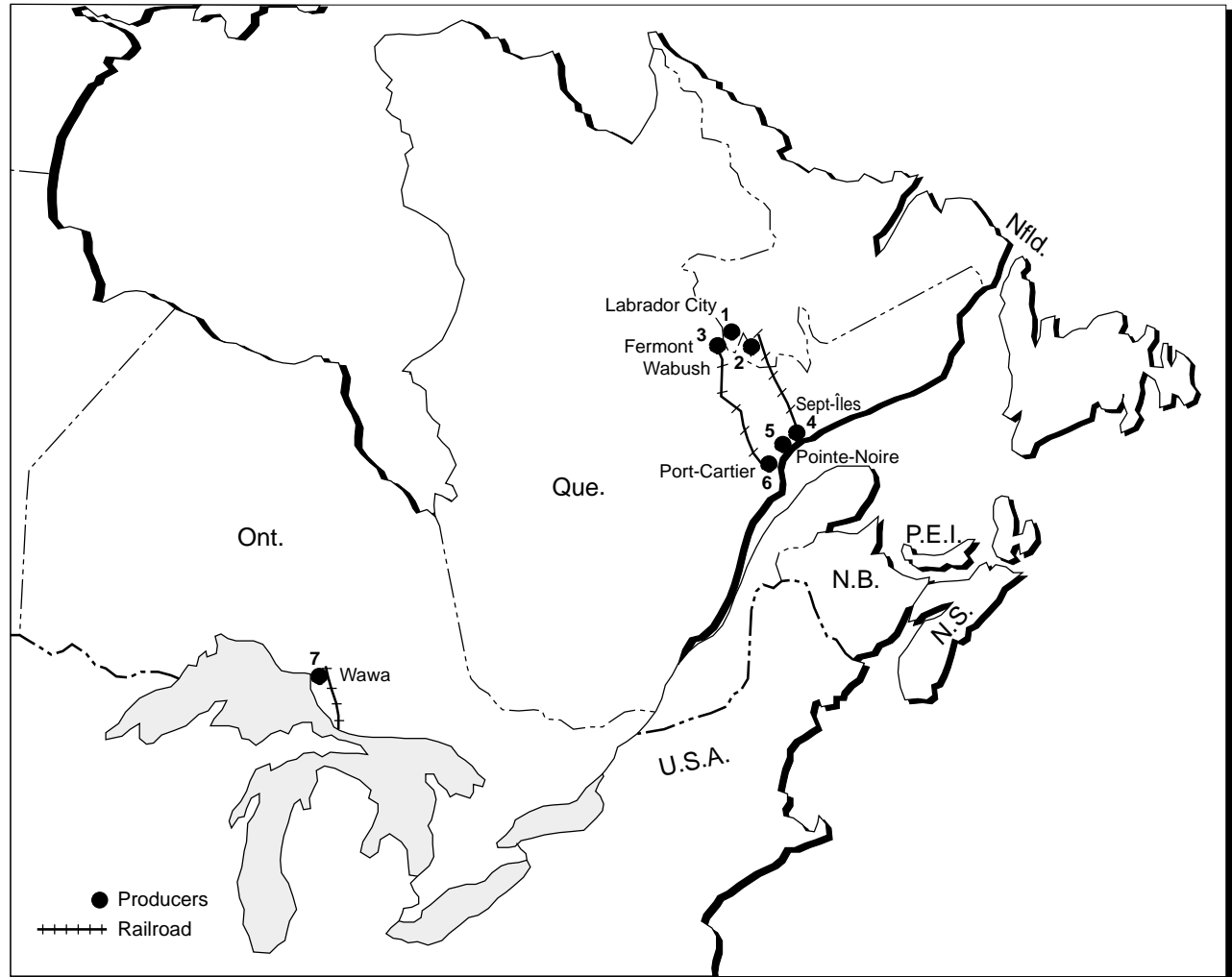
There was no significant change in performance at the IOC operations at Carol Lake and Sept-Îles. Production in 1995 reached 16.1 Mt, of which 10.8 Mt were pellets and 5.3 Mt were concentrate that was not pelletized. Shipments of iron ore products decreased slightly to 15.0 Mt from 15.5 Mt in 1994.

Increased production of DRI worldwide is contributing to a tight supply situation for pellets as demand is presently out-stripping supply. IOC is proceeding to incrementally increase its pellet production capacity from 10.8 to 11 Mt/y in order to meet customer demands. Based on a stable market outlook for next year, it is expected that 16.7 Mt of iron ore products will be shipped in 1996.

IOC is currently concentrating on modernizing and refurbishing its process equipment and control systems in order to maintain its position as a supplier of high-quality products in the international market. The company has achieved its ISO 9002 Registration in accordance with the new 1994 standards. It has also successfully completed the ISO 9002-94 Registration on the QNS&L railway maintenance facilities.

M.A. Hanna Co. sold its remaining 8.14% interest in IOC back to IOC, but continues as managing agent until the end of 1996. M.A. Hanna also retains its 50% ownership of IOC Ore Sales Co., which markets IOC's iron ore pellets and concentrate around the world. The remaining partners therefore increased their relative shares in IOC so that ownership is now divided as follows: Bethlehem Steel Corporation, 37.58%; Mitsubishi Corporation, 21.77%; National

Figure 1
Iron Ore in Canada, 1995



Numbers refer to locations on map above.

PRODUCERS

1. Iron Ore Company of Canada, Carol Lake Division (mine/concentrator/pellet plant)
2. Wabush Mines (mine/concentrator)
3. Quebec Cartier Mining Company (mine/concentrator)
4. Iron Ore Company of Canada (port)
5. Wabush Mines (pellet plant/port)
6. Quebec Cartier Mining Company (pellet plant/port)
7. Algoma Ore, division of Algoma Steel Inc. (mine/concentrator/sinter plant)

Steel Corporation, 21.73%; Labrador Iron Ore Royalty Income Fund, 11.97%; and Dofasco Inc., 6.95%.

QCM produced 16.1 Mt of iron ore concentrates in 1995, of which over half was used to produce 8.3 Mt of pellets; the rest was sold as sinter feed. Pellet production reached a new record for the nominal 6-Mt/y plant, while concentrate production was some 0.5 Mt lower than in 1994. Shipments exceeded production as stocks were drawn down to meet the strong market.

In March 1995, QCM became the first iron ore mine in the world to obtain ISO 9001 certification. ISO 9001 covers design (product development) in addition to production, installation and servicing defined for ISO 9002, which QCM obtained in 1992. Canadian mines led the way in introducing quality systems, beginning with IOC in 1991 when it was the first iron ore mine in the world to obtain ISO 9002 registration.

QCM invested \$6 million in a new concentrates upgrading plant that became operational in September 1995, which will help to significantly

reduce the silica level in the low-silica pellet used for DRI production. At Port Cartier, QCM invested \$850 000 in a water recycling project that will significantly reduce the amount of wash water flowing into the port from the cleaning of the conveyors. Eighty percent of the water used to clean the conveyors will now be recycled water.

For 1996 QCM is forecasting production and sales to reach 16.5 Mt as operations continue at close to capacity.

Wabush Mines produced 5.3 Mt of iron ore pellets in 1995, an increase of nearly 650 000 t over 1994. Shipments were 5.1 Mt of pellets and just over 100 000 t of concentrate.

After extremely low capital investment during the last four years, the Wabush Board of Directors approved major expenditures in 1995 to upgrade mining equipment such as a production loader, haulage trucks, a bulldozer and a grader. In addition, Wabush will invest in improving concentrate weight recovery through mill grind control and computer control systems. A similar capital investment for further modernization is projected for 1996.

Wabush effectively restored its operating capacity to the pre-1992 level of 6.0 Mt/y. With the injection of capital to modernize, and a return to operations at the original plant capacity, Wabush forecasts production and sales to reach 5.7 Mt in 1996.

In 1995, the Algoma Ore Division (AOD) of Algoma Steel Inc. produced about 975 000 t of sinter at its mine and sinter plant complex in Wawa, Ontario. Of that production, 128 000 t was Low Base sinter with a CaO:SiO₂ ratio of 1:1, and 847 000 t was superflaxed sinter with a CaO:SiO₂ ratio of 2.2:1. All the sinter was shipped by rail to the Algoma Steel mill in Sault Ste. Marie.

AOD used approximately 400 000 t of reverts in 1995 and 200 000 t of limestone, along with 850 000 t of siderite ore from the McLeod mine. Taking into account the iron content of the ore and the sinter, an estimated 540 000 t of sinter product were attributable to the mine (Table 1).

In 1996, 325 000 t of reverts, 120 000 t of limestone and 650 000 t of McLeod ore are scheduled to be used in operations. The production of sinter is forecast to decline by about 15% with more than half of that production being superflaxed sinter and the remainder being Low Base sinter.

Exploration and development were pursued at iron ore deposits at Roche Bay in the Northwest Territories; on Ungava Bay, Quebec; at Schefferville, Quebec; and in the Peace River area of Alberta. Interest in these deposits has been revived by the recent strengthening of iron ore prices and forecasts for strong iron ore markets around the turn of the century.

World Developments

World iron ore production for 1995 is estimated to have been 985 Mt, a small increase from the previous year. China, Brazil and Australia are the world's largest iron ore producers, accounting for over half of the total.

World trade reached 434 Mt for the year. Australia and Brazil each increased exports by 10 Mt to 130 Mt, a record level for both countries. The next largest exporters were India (31 Mt), Canada (30 Mt), the Republic of South Africa (21 Mt), Sweden (17 Mt), Kazakstan (12 Mt), Ukraine (11 Mt) and Russia (11 Mt). Japan's imports of iron ore increased to 121 Mt in 1995, the highest level in four years. The European Union increased its imports to 144 Mt, the highest level since 1979.

Exports account for more than three quarters of Canada's iron ore shipments and, although the largest single customer is the United States, European destinations account for nearly 50% of all shipments of Canadian iron ore. The Canadian industry is, therefore, very sensitive to competition from U.S. mines in the North American market and to competition from countries that ship to the European market. Pellet demand improved because of a continued upturn in the steel sector in Canada's traditional markets. North American demand for iron ore pellets continued to grow as steel production increased by over 6%. The Western European steel industry added to the recovery experienced in 1994 with its crude steel production increasing by 2% and pig iron production up 1%.

U.S. steel production increased markedly in 1995 to meet an increase in demand as replacement for imported steel. Iron ore demand increased proportionately so that both imports and domestic shipments exceeded 1994 levels. U.S. mines increased production by 4 Mt. Canadian exports of iron ore to the United States declined slightly to 9.3 Mt. Brazil, however, profited from the high demand in the United States by increasing its exports there to 5 Mt.

China, the largest producer of iron ore in the world, has tremendous reserves of low-grade iron ore, but has been importing ore to supplement domestic supplies for its steel industry. It continued to import iron ore at the 37-Mt/y level. Its steel industry did not expand for the first time in 14 years; production remained at about 91 Mt. China's domestic iron ore production decreased slightly with the closing of a number of small uneconomic mines. To ensure future supplies, China has invested in mines in Australia and Peru in recent years.

Brazil's largest iron ore producer, Companhia Vale do Rio Doce (CVRD), continued to produce at a record level to serve domestic and export markets. A strong international market for pellets induced CVRD and Pohang Iron and Steel Co. Ltd. of Korea to form a

joint venture to construct a 4-Mt/y pellet plant near Rio de Janeiro. The plant should open in 1998.

The Brazilian government decided to sell its 51% interest in CVRD as part of its privatization policy. The share, valued at US\$6 billion, is expected to be transferred in the next two to three years.

Minerações Brasileiras Reunidas SA (MBR), Brazil's second largest iron ore producer, achieved sales of 25 Mt in 1995, down very slightly from 1994. It proceeded with its plan to increase production to 35 Mt/y by the turn of the century through mine openings and railway extensions in the Belo Horizonte region.

Samarco Mineração SA announced the construction of a 5-Mt/y pellet plant at its Ponta Ubu complex. The new plant, scheduled for operation in 1997, will bring Samarco's pellet capacity to 11 Mt/y.

Australian iron ore production topped 138 Mt in 1995 and capacity is expected to reach 149 Mt/y by the year 2000. Hamersley Iron Pty., Ltd. is gradually expanding the Australia-China joint-venture Channar mine from 6 Mt/y to 10 Mt/y. Hamersley also opened the Paraburdoo fines processing plant to upgrade Channar and Paraburdoo fines. BHP Iron Ore Pty Ltd. increased the production capacity at the Yandi mine from 10 Mt/y to 15 Mt/y and plans a further expansion to 25 Mt/y. BHP has two other projects planned: exploitation of the Kennedy Gap deposit at the Yarrarie operation, and expansion of the Jimblebar project from 3 Mt/y to 8 Mt/y. Robe River Limited produced 26.4 Mt and shipped 26.5 Mt, both record levels. Robe also upgraded its facilities, which raised its production capacity to 32 Mt/y and will enable it to produce 2 Mt/y of lump ore in addition to its usual sinter fine product.

Hancock Resources Ltd. investigated markets and searched for joint-venture partners after evaluating a 1994 feasibility study on the Hope Downs deposit. Development of the gas reserves off the north coast of Western Australia has encouraged projects that would link taconite mines to hot-briquetted iron plants in the Pilbara region. Two projects investigated in 1995 were the Mineralogy Pty Ltd. plans for the Fortescue deposits, and the Asia Iron Ltd. project for the Mt. Gibson deposit.

India, the fifth largest iron ore producer in the world and also a major exporter, has some 289 mines located mainly in five states. Production increased for the third year in a row to reach a new record, but exports remained near 30 Mt. India's policy to expand its steel industry has increased domestic demand for iron ore and the forecast is that even as iron ore production increases further, exports will be held to between 30 and 35 Mt/y or less. This situation is important for Japan, which has seen its imports of iron ore from India decline from 21 Mt in 1990 to 16 Mt in 1995.

The Venezuelan iron ore producer CVG Ferrominera Orinoco C.A. opened a new 3.3-Mt/y pellet plant in October 1994. The plant brings Venezuelan pellet capacity to almost 10 Mt/y. Production of iron ore pellets plus fines in 1995 increased by 5.5 Mt to place Venezuela ahead of Sweden as an iron ore producer and, at 11.5 Mt in exports, to be ranked eighth in the world.

Sweden was able to capitalize on the strong European market to increase production and sales in 1995. Of nearly 22 Mt in sales, 14 Mt were pellets, including about 2 Mt exported for use in direct reduction plants. The sole Swedish iron ore producer, Luossavaara Kiirunavaara AB (LKAB), has invested heavily in recent years and now has a new 4-Mt/y pellet plant and a new harbour at Luleå that will help it ship more pellets in 1996. In the longer term, LKAB is completing a new main level at its mine in Kiruna to open up reserves for many more years of operation.

UNCTAD Work on Iron Ore

In 1995, the Trust Fund Project on Iron Ore Information, a separately funded project under the United Nations Conference on Trade and Development (UNCTAD), published two statistical reports and a market report. The reports are a unique source of iron ore trade data, tracing the flows among the major importing and exporting countries. The economic analysis that is included provides an independent global picture of the state of the iron ore industries in all countries.

The Intergovernmental Group of Experts on Iron Ore (IGEIO), also under UNCTAD, met in Geneva October 23-25, 1995, with representation from 28 countries and 17 major importing and exporting companies. Guest speakers from the International Iron and Steel Institute, la Société générale de surveillance, and Sollac (Groupe Usinor Salcor) gave forecasts for iron ore demand into the next century, and informed the meeting about quality considerations that will affect products and the specifications for iron ore pellets and fines to meet technological changes in steel-making.

The UNCTAD Secretariat, working for the IGEIO, also published iron ore statistics that were complementary to the trust fund project publications. The UNCTAD reports cover more countries, include the iron content of the ore, and provide forecasts on iron ore, pig iron and steel production, consumption and trade. The Secretariat has contacts in 87 countries covering all significant producers and consumers.

The IGEIO is scheduled to meet again October 21-23, 1996, to discuss developments in the production, marketing and consumption of iron ore.

Prices

Iron ore prices improved in 1995 for all grades of internationally traded iron ore. For concentrates the increase was 5-6% and for lump 8-10% in both the European and Japanese markets. For pellets in Europe, the increase was 13-15% depending on the source. The spread in price between concentrates and pellets increased to US\$22.35/Fe unit,¹ the highest premium ever.

Negotiations for 1996 deliveries had not been completed by the end of 1995. Most forecasters see the current scarcity of iron ore pellets and lumps continuing into the medium term and consequent price increases at least for 1996.

PRIMARY IRON

Primary iron is defined to include blast furnace iron, direct reduced iron (DRI) and, in Canada, electric smelted iron. It is the main raw material used to make steel and other iron products such as castings.

There are two technologies used to produce steel: basic oxygen furnaces, which are charged with molten blast furnace iron and ferrous scrap at the integrated steel mills; and electric furnaces, which are charged with scrap and/or DRI at the mini-mill plants. Approximately 50% of the iron units used to make steel in Canada come from scrap.

World pig iron production is estimated at 520 Mt in 1995, an increase of 3% over 1994. World steel production also increased to reach 750 Mt, an increase of 3.5%. The steel industries in both Canada and the United States were operating at close to capacity throughout most of the year.

Canadian Developments

The economic improvement that started in 1993 strengthened in 1994 and 1995. The Canadian steel industry operated at high levels of capacity and increased production of pig iron and steel by about 6%. In spite of this performance, imports of steel products increased to exceed 30% of domestic consumption. Imports from the United States alone accounted for over 17% of the Canadian market, an increase of 3%, or 700 000 t above the level of the previous year. Five million tonnes, or one third of Canadian production, were exported, mainly to the United States where they make up less than 4% of the market.

Canadian production of pig iron recovered to the 1993 level of 8.7 Mt as six blast furnaces at Dofasco Inc.,

¹ Price is reported in cents, U.S. currency, for each percentage point of iron in a tonne of ore, e.g., at 30¢/Fe unit, ore grading 65% iron would bear a price of 65 x 30¢ = US\$19.50/t.

Stelco Inc. and Algoma Steel Inc. operated at capacity for nine months; a seventh furnace operated for three months.

Another source of primary iron are the nine electric furnaces at the ilmenite smelting facility operated by QIT-Fer et Titane Inc. at Tracy, Quebec. These furnaces have the capacity to produce 900 000 t/y of iron as a co-product with titanium dioxide. The iron is used to produce three products: a range of specialty pig iron grades, which are sold mainly to the foundry industry; iron powder used by the powder metallurgy industry; and continuous cast, high-quality steel billets, which are sold to the steel industry for re-rolling. This facility continued to operate at capacity during 1995.

QIT won the 1995 Quebec environmental performance award for commissioning a new treatment facility to remove process water from the effluent returning to the St. Lawrence River.

DRI is a semi-metallic product made by reducing iron ore in its solid state to approximately 95% metallics. Sidbec-Dosco Inc., at Contrecoeur, Quebec, restarted its idled 400 000-t/y Midrex DRI plant which, with its already operating 750 000-t/y unit, was able to produce over 1 Mt of DRI in 1995. DRI, together with scrap, is used to produce steel at the company's electric furnace steel mill.

World Developments

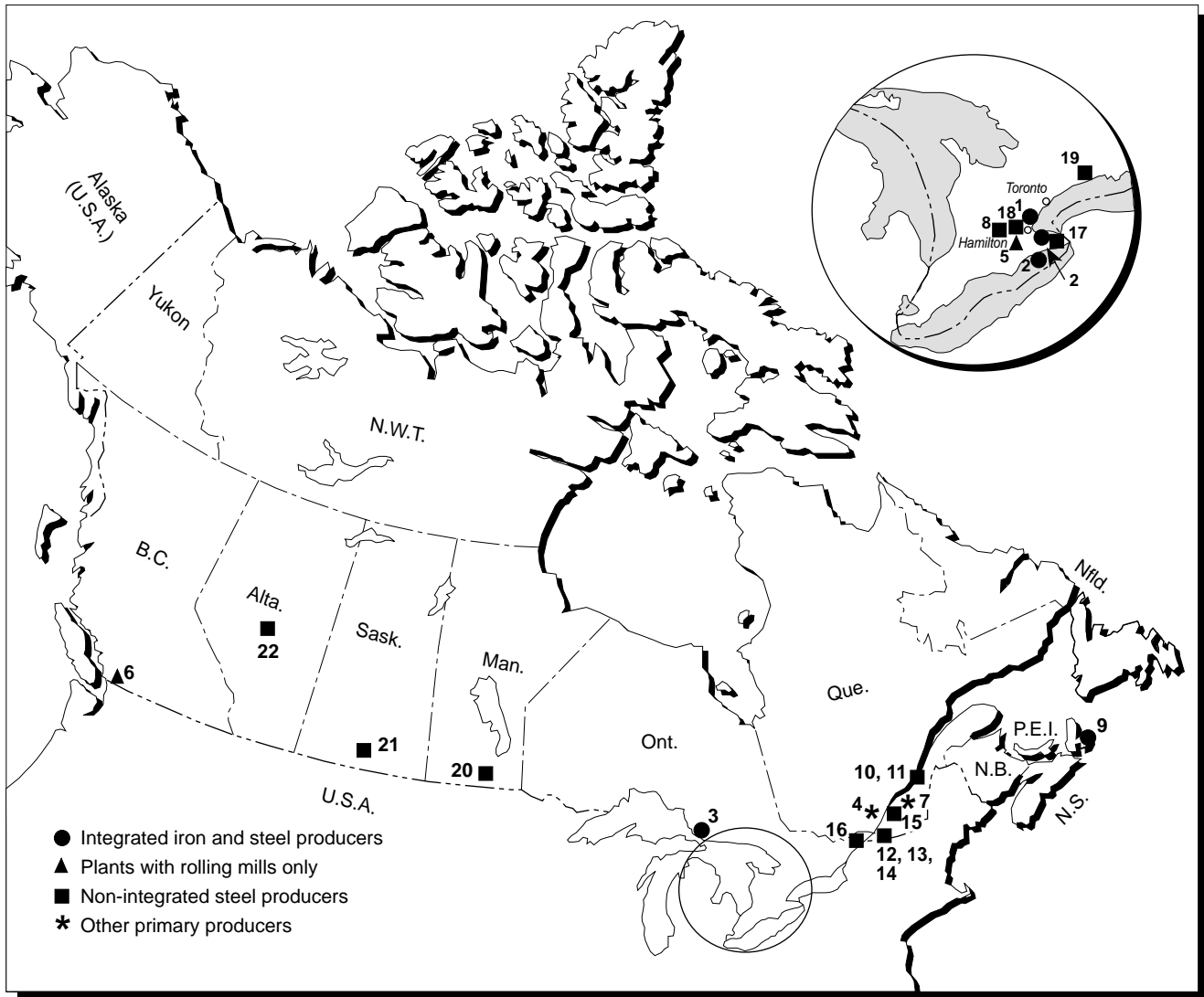
Almost all blast furnace construction, except replacement of existing capacity, is planned for Southeast Asia. The Republic of Korea's Pohang Iron and Steel Co. Ltd. has announced plans for a new blast furnace which, with the associated steel-making equipment, would make it the largest steel producer in the world. In Taiwan, the Yeih Long Group is planning to build a steel complex with three blast furnaces, and China Steel plans to introduce a fourth blast furnace at its operating steel mill.

DRI accounts for less than 6% of primary iron production, but has become the technology of choice for a number of new projects. Midrex Direct Reduction Corporation has built plants that accounted for about 67% of world DRI and hot briquetted iron (HBI) production in 1995, with the HYL-1 and HYL-111 plants the second most important. Total DRI production is estimated to have been 30 Mt in 1995, an increase of nearly 10% since 1994.

Areas in the world with good potential to increase production of DRI and HBI are the Middle East, Venezuela and Australia, where large quantities of natural gas are available. In Australia and Venezuela there is the added advantage of nearby sources of iron ore.

In 1995, Australia became the most active area with four project proposals involving DRI and one project

Figure 2
Iron and Steel in Canada, 1995



Numbers refer to locations on map above.

INTEGRATED IRON AND STEEL PRODUCERS

- 1. Dofasco Inc. (Hamilton)
- 2. Stelco Inc. (Hamilton and Nanticoke)
- 3. Algoma Steel Inc. (Sault Ste. Marie)

OTHER PRIMARY PRODUCERS

- 4. Sidbec-Dosco Inc. (Contrecoeur)
- 7. QIT-Fer et Titane Inc. (Sorel)

PLANTS WITH ROLLING MILLS ONLY

- 5. Stanley Strip Steel, division of Stanley Canada Inc. (Hamilton)
- 6. Pacific Continuous Steel Limited (Delta)

NON-INTEGRATED STEEL PRODUCERS

- 8. Courtice Steel Inc. (Cambridge)
- 9. Sydney Steel Corporation (Sydney)
- 10. Stelco Inc. (Contrecoeur)
- 11. Atlas Stainless Steels, division of Sammi Atlas Inc. (Tracy)
- 12. Sorel Forge Inc., division of Slater Industries Inc. (Montréal)
- 13. Canadian Steel Foundries Ltd., division of Hawker Siddeley Canada Inc. (Montréal)
- 14. Canadian Steel Wheel Limited (Montréal)
- 15. Sidbec-Dosco Inc. (Montréal and Longueuil)
- 16. Ivaco Inc. (L'Original)
- 17. Atlas Specialty Steels, division of Sammi Atlas Inc. (Welland)
- 18. Hamilton Specialty Bar, division of Slater Industries Inc. (Hamilton)
- 19. Co-Steel Inc. (Whitby)
- 20. M.R.M. Steel Limited
- 21. IPSCO Inc. (Regina)
- 22. Stelco Inc. (Edmonton)

based on iron carbide. BHP has proposed the construction of a 2-Mt/y HBI plant at Nelson Point, which would use fines from the company's Mt. Newman operations. Australian United Steel Industry (AUSI) has commissioned a feasibility study for a 3-Mt/y HBI plant at Cape Lambert. Mineralogy Pty Ltd. is pursuing development of a 4-Mt/y HBI plant based on the Fortesque taconite deposits. Ore from these deposits would require more grinding and concentrating than the Australian ores currently mined, but it is located closer to the coast of the Indian Ocean. Asia Iron Ltd. commenced pre-feasibility studies on a 1.5-Mt/y HBI project that would be fed from magnetite ores of the Mt. Gibson deposit. Kingstream Resources NL is considering development of Tallering Peak iron ore to be fed to a DRI plant that would eventually supply a 700 000-t/y steel mill. Mitsubishi Corporation is assessing sites in the Pilbara region for a 300 000-t/y iron carbide plant.

In Venezuela, the seven DRI plants produced over 4 Mt in 1995. Sidetur, which operates two DRI plants, is constructing a 1-Mt/y DRI/HBI plant.

Several projects are planned for India where the intended growth in DRI production will take it from 3.1 Mt in 1994 to 12.5 Mt in 2010.

In the United States, National Steel Pellet Co. investigated the potential for a 500 000-t/y DRI plant for Keewatin, Minnesota.

OUTLOOK

Steel production around the world appears to be headed for another strong year that will maintain the high level of demand for iron ore, especially lumps and pellets. In the near term, the volume of iron ore shipments will remain high. However, in spite of the supply pressure for different products, iron ore prices have remained relatively weak on an inflation adjusted basis. It is essential that the current market changes are adequately reflected in future price increases in order to restore a balanced condition, especially for pellets. On a world scale, adequate returns will be necessary to build additional production capacity.

New blast furnace construction in Southeast Asia also indicates a commitment to the technology of integrated steel mills, which are the traditional market for iron ore producers. For existing iron ore mines around the world, this trend assures them that there will be a long-term market for concentrate, fines, pellets and lump ore. On the other hand, the new blast furnace capacity may not wholly compensate for the expected closures of older steel mills, especially in the former Soviet Union and eastern Europe. In balance, the transition to new technolo-

gies will be slow, which will give iron ore producers the opportunity to adjust product specifications to meet the market.

The forecast of global shortages of low residual scrap is expected to encourage production of DRI and iron carbide, as well as to accelerate development of new steel-making technologies. In the near term, this will boost the demand for DRI-grade pellets. In the longer term, iron ore companies will need to prepare iron ore products to individual customer specifications needed for the new technologies.

For Canadian iron ore mines and iron- and steel-makers, the prospect is for at least one more year with shipments at the 1994 and 1995 level. There are indications, however, that the downside of the economic cycle will hit the industries in North America and Europe before the end of the decade. In the longer term, since they are dependent on exports, the success of the industries will be directly linked to their ability to maintain international competitiveness.

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 31, 1996.

TABLE 1. CANADA, IRON ORE PRODUCTION AND TRADE, 1994 AND 1995P

Item No.	1994		1995P	
	(tonnes) ¹	(\$000)	(tonnes) ¹	(\$000)
PRODUCTION (mine shipments)				
Newfoundland	20 278 926	743 137	20 963 499	814 403
Quebec	15 652 110	x	15 505 000	x
Ontario	411 566	x	577 837	x
British Columbia	73 786	1 663	83 795	1 989
Total ²	36 416 388	1 214 862	37 130 131	1 212 040
IMPORTS				
2601.11	Iron ore concentrates, non-agglomerated			
United States	72 185	1 732	101 344	2 539
Norway	-	-	33 183	1 601
Turkey	-	-	2 580	85
Brazil	35 884	1 296	-	-
Russia	72	2	-	-
India	58	1	-	-
Japan	52	1	-	-
Canada	12	..	-	-
Germany	5	..	-	-
Other countries	-	-	367	11
Total	108 268	3 035	137 474	4 238
2601.12	Iron ore, agglomerated			
United States	4 860 091	209 145	5 336 434	235 466
Brazil	280 845	10 929	449 104	19 651
Sweden	-	-	45 432	2 157
Other countries	-	-	400	21
Total	5 140 936	220 075	5 831 370	257 297
EXPORTS				
2601.11	Iron ore concentrates, non-agglomerated			
United Kingdom	2 769 873	58 987	2 412 576	52 533
France	2 222 314	44 377	2 004 867	42 473
Germany	2 815 416	62 820	1 920 693	45 686
Netherlands	1 416 166	25 819	1 633 293	26 644
Japan	1 095 091	17 083	1 239 028	19 328
United States	1 217 640	32 032	933 948	28 771
South Korea	795 560	12 410	755 005	12 249
Belgium	304 626	8 620	189 215	5 355
Philippines	432 782	6 751	180 142	2 810
Spain	179 311	4 170	151 709	3 522
China, People's Republic of	-	-	142 952	2 562
Finland	137 246	2 652	63 450	1 267
Portugal	29 500	633	9 000	217
Chile	-	-	2 450	27
Austria	54 969	934	-	-
Sweden	94 583	2 152	-	-
Taiwan	25 078	718	-	-
Italy	339 099	8 909	-	-
Australia	88 765	1 470	-	-
Total	14 018 019	290 546	11 638 328	243 451
2601.12	Iron ore, agglomerated			
United States	8 855 324	404 090	8 288 719	357 332
Germany	2 169 447	79 748	1 690 835	70 159
Netherlands	1 291 703	37 428	1 569 321	43 782
Belgium	1 816 592	58 631	1 536 817	53 038
United Kingdom	824 365	25 827	1 205 120	44 468
Italy	125 440	5 960	1 023 789	47 983
Spain	424 863	17 527	423 109	17 978
Taiwan	-	-	321 493	9 146
Turkey	-	-	262 321	9 483
Finland	-	-	198 577	8 220
Portugal	290 440	9 834	185 950	5 669
Norway	-	-	175 262	4 881
China, People's Republic of	-	-	145 137	4 042
South Korea	-	-	96 194	3 121
Dominican Republic	-	-	50 000	1 386
France	57 524	2 264	21 950	968
South Africa	-	-	118	7
Australia	33 774	962	-	-
Austria	85 816	2 445	-	-
Venezuela	86	21	-	-
Total	15 975 374	644 741	17 194 712	681 670

TABLE 1 (cont'd)

Item No.	1994		1995p	
	(tonnes) ¹	(\$000)	(tonnes) ¹	(\$000)
EXPORTS (cont'd)				
Total exports, all classes				
United States	10 072 964	436 123	9 222 667	386 104
United Kingdom	3 594 238	84 814	3 617 696	97 001
Germany	4 984 863	142 568	3 611 528	115 845
Netherlands	2 707 869	63 247	3 202 614	70 427
France	2 279 838	46 641	2 026 817	43 441
Belgium	2 121 218	67 251	1 726 032	58 393
Japan	1 095 091	17 083	1 239 028	19 328
Italy	464 539	14 870	1 023 789	47 983
South Korea	795 560	12 410	851 199	15 370
Spain	604 174	21 697	574 818	21 500
Taiwan	25 078	718	321 493	9 146
China, People's Republic of	—	—	288 089	6 604
Turkey	—	—	262 321	9 483
Finland	137 246	2 652	262 027	9 488
Portugal	319 940	10 468	194 950	5 887
Philippines	432 782	6 751	180 142	2 810
Norway	—	—	175 262	4 881
Dominican Republic	—	—	50 000	1 386
Chile	—	—	2 450	27
South Africa	—	—	118	7
Australia	122 539	2 433	—	—
Sweden	94 583	2 152	—	—
Austria	140 785	3 380	—	—
Venezuela	86	21	—	—
Total	29 993 393	935 287	28 833 040	925 121
Consumption of iron ore at Canadian iron and steel plants	12 682 730	..	13 445 000	..

Sources: Natural Resources Canada; Statistics Canada; American Iron Ore Association.

— Nil; .. Not available; p Preliminary; x Confidential.

¹ Dry tonnes for production (shipments) by province, natural weight for imports and exports. ² Total iron ore shipments include shipments of by-product iron ore.

Note: Where applicable, data for East Germany and West Germany have been combined.

TABLE 2. CANADA, IRON ORE SHIPMENTS, 1992-95

Company and Location	Ore Mined	Product Shipped	1992	1993	1994	1995p
Algoma Ore Division Algoma Steel Inc. Wawa, Ontario	Siderite	Sinter ¹	1 037	1 074	788	975
Iron Ore Company of Canada Schefferville, Quebec	Hematite, goethite and limonite	Direct shipping	120	65	—	—
Carol Lake, Labrador	Specular hematite and magnetite	Concentrate	4 818	5 640	5 475	4 634
		Acid pellets	6 346	6 161	6 547	3 121
		Fluxed pellets	1 467	2 010	3 484	7 084
		Chips	18	11	—	188
Quebec Cartier Mining Company Mount Wright, Quebec	Specular hematite	Concentrate	7 213	7 782	8 206	7 887
		Acid pellets	2 934	3 237	3 763	3 304
		Fluxed pellets	2 908	2 622	3 379	3 391
		Low Si pellets	1 041	1 055	1 025	1 381
Wabush Mines Wabush, Labrador and Pointe-Noire, Québec	Specular hematite and magnetite	Acid pellets	3 146	2 847	3 035	3 270
		Fluxed pellets	1 547	1 982	1 670	1 840
		Concentrate	483	142	369	130
		Chips	—	51	2	103
British Columbia producers	Magnetite	Concentrate	62	57	74	84
Total			33 140	34 736	37 817	37 392

Source: Natural Resources Canada.

— Nil; p Preliminary.

¹ Includes about 400 000 t of iron-bearing material not from the mine.

TABLE 3. RECEIPTS, CONSUMPTION AND INVENTORIES OF IRON ORE AT CANADIAN IRON AND STEEL PLANTS, 1994 AND 1995

	1994	1995
	(000 tonnes)	
Receipts imported	6 006	6 125
Receipts from domestic sources	6 801	7 816
Total receipts at iron and steel plants	12 807	13 942
Consumption of iron ore	12 683	13 330
Inventory at docks, plants, mines and furnace yards, December 31	7 178	7 385
Inventory change	138	207

Source: American Iron Ore Association.

TABLE 4. WORLD IRON ORE PRODUCTION, 1993-95

	1993	1994	1995
	(000 tonnes)		
China	234 730	239 032	213 199
Brazil	149 973	167 810	171 000
Australia	121 429	128 662	138 000
Russian Federation	76 143	73 302	75 828
India	55 608	58 388	60 700
United States	55 661	58 382	62 720
Ukraine	65 503	54 400	55 000
Canada	33 228	36 416	37 902
Republic of South Africa	29 385	32 321	32 522
Sweden	18 728	19 909	21 900
Venezuela	17 479	17 973	23 514
Mauritania	9 565	10 443	11 140
Kazakstan	12 634	10 100	13 894
North Korea	9 500	9 000	9 000
Other countries	49 129	56 647	59 047
Total	938 695	972 785	985 365

Sources: Natural Resources Canada, UNCTAD Intergovernmental Group of Experts on Iron Ore.

TABLE 5. CANADIAN CONSUMPTION OF IRON-BEARING MATERIALS BY INTEGRATED¹ IRON AND STEEL PRODUCERS, 1994

Material Consumed	Consumed In					Iron and Steel-making and DRI Production
	Sinter Plants at Steel Mill	Direct Reduction Plants	Iron and Steel Furnaces			
Production of Pig Iron			Steel Furnaces	Total in Furnaces		
	(tonnes)					
Iron ore						
Crude and concentrate	565 684	351 161	–	–	–	351 161
Pellets	35 572	781 616	10 725 812	24 592	10 750 404	11 532 020
Sinter	–	–	669 723	–	669 723	669 723
Sinter produced at steel plants	–	–	230 776	–	230 776	230 776
Direct reduced iron	–	–	–	779 261	779 261	779 261
Other iron-bearing materials including flue dust, mill scale, cinder, slag, etc.	491 583	–	2 573 280	91 045	2 664 325	2 664 325
Total	1 092 838	1 132 777	14 199 591	894 898	15 094 489	16 227 266

Source: Company data.

– Nil.

¹ Algoma Steel Inc.; Dofasco Inc.; QIT-Fer et Titane Inc.; and Stelco Inc.**TABLE 6. NORTH AMERICAN PRICES OF SELECTED ORES AT YEAR-END 1980, 1990, AND 1993-95**

	1980	1990	1993	1994	1995
	(US\$/t)				
Mesabi Non-Bessemer ¹	27.61	29.557-31.03	29.557-31.03	29.557-31.03	29.557-31.03
	(US¢/t iron unit) ²				
Pellets					
Lake Erie base price ³	71.36	71.31-73.47	71.31-73.47	71.31-73.47	71.31-73.47
U.S. Steel ⁴	–	36.756	36.756	36.756	36.756
Upper Lakes ⁵	–	46.10-58.46	46.10-58.46	46.10-58.46	46.10-58.46
Wabush Mines ⁶	62.5	62.5	62.5	62.5	62.5
	(US\$/t)				
Direct reduced iron	–	115-135	115-135	115-135	115-135

Sources: *Skilling's Mining Review*; *Iron Age*.

– Nil.

¹ US\$/t, 51.5% of iron natural, at rail of vessel, lower lake ports. ² One iron unit equals one percentage point of iron content in a tonne of ore; therefore, an ore containing 60% iron has 60 iron units. ³ Cleveland-Cliffs Inc., IOC Ore Sales Co., Oglebay Norton Company at rail of vessel, lower lake port. ⁴ At mine. ⁵ Pickands-Mather & Co. and Inland Steel Mining Co. in hold of vessel, upper lake ports. ⁶ f.o.b. Pointe-Noire.

TABLE 7. SELECTED PRICES OF IRON ORE BOUND FOR JAPAN AND EUROPE, 1986-95

Ore	Market	Source	1986	1987	1988	1989	1990	1991	1992	1993	1994	1995
(US\$/Fe Unit Dmt, f.o.b.)												
Fines (including concentrate)	Europe	CVRD	26.26	24.50	23.50	26.56	30.80	33.25	33.10	29.09	26.47	23.38
		Iscor	22.70	—	20.55	20.70	24.75	22.61	20.60	..
		Kiruna	27.90	25.25	26.00	30.00	35.70	37.10	36.50	30.50	28.10	30.85
		Carol Lake	26.50	24.03	23.69	27.00	31.78	34.60	33.15	28.50	26.15	27.70
	Japan	Mt. Wright	26.50	24.03	23.69	27.00	31.78	34.60	33.15	28.50	26.15	27.70
		CVRD	23.29	21.89	20.90	23.61	27.38	30.05	28.11	25.02	22.65	23.96
		Iscor	20.23	18.85	17.75	20.37	23.62	25.49	24.24	21.57	19.21	20.32
		Hamersley ²	25.56	24.28	23.31	26.34	30.54	32.96	31.35	27.90	25.26	26.72
		Carol Lake	22.09	20.93	19.93	22.52	26.11	28.18	27.26	24.26	21.96	23.23
Lump	Europe	Iscor	26.70	23.50	22.34	—	—	—	—
		Hamersley ¹	36.20	33.15	36.00	43.00	49.97	50.25	48.28	42.06	40.28	45.15
	Japan	CVRD	23.29	21.89	21.89	25.20	29.22	30.96	29.00	25.91	24.38	26.31
		Iscor	23.53	21.99	21.86	26.05	30.21	32.01	30.27	27.60	25.74	28.29
Pellets	Europe	CVRD	35.60	36.70	40.35	47.33	51.60	52.15	48.47	43.64	43.64	49.14
		Kiruna	38.15	41.15	46.35	53.50	59.00	57.50	53.48	45.70	45.60	52.40
		Carol Lake	36.50	37.15	39.95	48.35	52.58	53.00	49.35	44.25	44.00	50.05
		Mt. Wright	36.50	37.15	39.95	48.35	52.58	53.00	49.35	44.25	44.00	50.05
	Japan	CVRD										
		(Nibrasco)	34.73	35.04	37.93	44.49	48.50	49.03	45.57	41.03	41.03	46.19
		Savage River	35.45	34.17	35.89	42.10	45.90	46.39	43.12	38.83	38.83	43.72

Source: *The Tex Report*.

— Nil; .. Not available; Dmt Dry metric tonne; f.o.b. Free on board.

¹ c.i.f. Rotterdam; ² f.o.b. Dampier.

TABLE 8. CANADA, CRUDE STEEL PRODUCTION AND SHIPMENTS, 1993-95

	1993	1994	1995 ^p
	(tonnes)		
FURNACE CAPACITY, JANUARY 1^a			
Steel ingot			
Basic oxygen converter	10 956 000	9 221 000	8 769 000
Electric	6 710 450	6 785 450	7 276 350
Total	17 666 450	16 006 450	16 045 350
Steel castings	374 600	327 000	257 300
Total furnace capacity	18 041 050	16 333 450	16 302 650
PRODUCTION			
Steel ingot			
Basic open-hearth and basic oxygen	9 195 775	8 479 808	8 799 423
Electric	5 100 580	5 320 520	5 513 743
Total	14 296 355	13 800 328	14 313 166
Continuously cast, included in total above	13 103 443	13 347 249	13 894 657
Steel castings ¹	91 045	96 625	101 498
Total steel production	14 387 400	13 896 953	13 996 155
SHIPMENTS FROM PLANTS			
Steel castings	99 831	107 988	99 884
Rolled steel products	13 312 911	13 406 027	13 334 662
Total shipments	13 412 742	13 514 015	13 434 546

Sources: Natural Resources Canada; Statistics Canada; *Primary Iron and Steel* (monthly).

^p Preliminary.

^a The capacity figures, as of January 1 in each year, take into account both new and obsolete capacity anticipated for the year.

¹ Produced mainly from electric furnaces.

TABLE 9. CANADA, PIG IRON PRODUCTION, SHIPMENTS, TRADE AND CONSUMPTION, 1993-95

	1993	1994	1995 ^P
	(tonnes)		
Furnace capacity January 1 ^a			
Blast	9 256 000	8 432 000	8 432 000
Electric	900 000	900 000	900 000
Total	10 156 000	9 332 000	9 322 000
Production			
Basic	w	w	w
Foundry iron ¹	w	w	w
Total	8 663 301	8 106 006	8 464 191
Consumption of pig iron			
Steel furnaces ²	9 026 557	8 498 781	8 985 072
Consumption of iron and steel scrap			
Steel furnaces	7 395 422	7 302 831	7 350 890

Sources: Natural Resources Canada; Statistics Canada; *Primary Iron and Steel* (monthly).

^P Preliminary; w Withheld to avoid disclosing company proprietary data.

^a The capacity figures, as of January 1 in each year, take into account both new and obsolete capacity anticipated for the year.

¹ Includes malleable iron. ² Includes pre-reduced iron.

TABLE 10. CANADA, IMPORTS AND EXPORTS OF STEEL, 1993-95

		1993		1994		1995 ^P	
		World	United States	World	United States	World	United States
IMPORTS							
Iron and steel	(000 t)	6 058	3 500	7 686	4 092	7 465	4 140
	(\$000)	3 284 288	1 910 670	4 511 697	2 312 110	5 170 936	2 764 554
Rolling mill products	(000 t)	2 900	1 264	4 544	1 529	4 676	1 926
	(\$000)	1 974 859	1 071 669	2 897 256	1 300 178	3 350 900	1 639 705
Steel mill products	(000 t)	3 341	1 569	5 121	1 909	5 234	2 308
	(\$000)	2 571 884	1 493 679	3 667 185	1 830 010	4 191 221	2 226 539
EXPORTS							
Iron and steel	(000 t)	5 173	4 666	4 671	4 458	4 929	4 482
	(\$000)	3 513 522	3 202 274	3 817 192	3 607 188	4 298 823	3 913 707
Rolling mill products	(000 t)	4 190	3 172	3 606	3 415	3 788	3 377
	(\$000)	2 467 798	2 202 795	2 573 974	2 401 453	2 870 421	2 559 007
Steel mill products	(000 t)	4 950	4 455	4 426	4 223	4 649	4 219
	(\$000)	3 151 362	2 868 578	3 406 789	3 215 745	3 803 207	3 459 547

Source: Statistics Canada.

^P Preliminary.