

# Iron Ore

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## **SUMMARY**

**I**ron ore is one of Canada's most important mineral products in terms of both tonnage and value. On that basis, Canada is the world's ninth largest iron ore producer and ranks fifth for exports. Canada's iron ore production is concentrated in the Labrador Trough, a major geological belt extending through northern Quebec and Labrador. The production in this area comes from three mining operations owned by Iron Ore Company of Canada, Quebec Cartier Mining Company, and Wabush Mines.

Preliminary data indicate that, in 2002, as a result of the strengthening global economy, Canada's iron ore shipments increased by 14.2% compared to the previous year while its iron ore exports rose by 17.1%.

Following an upsurge in demand from the steel industry, which registered a 5.5% hike in pig iron production, world iron ore production is expected to have increased by 7.6% in 2002. Due to increased demand from the People's Republic of China (China), iron ore exports are estimated to reach 499 Mt in 2002, a hike of about 4.5%.

The consolidation and restructuring of the global iron ore industry witnessed in the past two years should continue during the coming years to enable producers to improve their competitiveness through economies of scale. This will help the iron ore and steel industry preserve its market share as a supplier of low-cost, versatile, high-performance material of choice for use in a variety of applications. Any change in the economic situation in Asia is expected to have a marked impact on steel markets and, consequently, on iron ore use. China, for example, one of the fastest growing economies in the world, is expected to continue to look to foreign suppliers to satisfy a large part of its iron ore requirements. These have been rising at an annual growth rate of more than 18% over the

past decade. Producers from Brazil, Australia, India, South Africa and Sweden are gearing up their iron ore production to take advantage of this increase in demand from Asia.

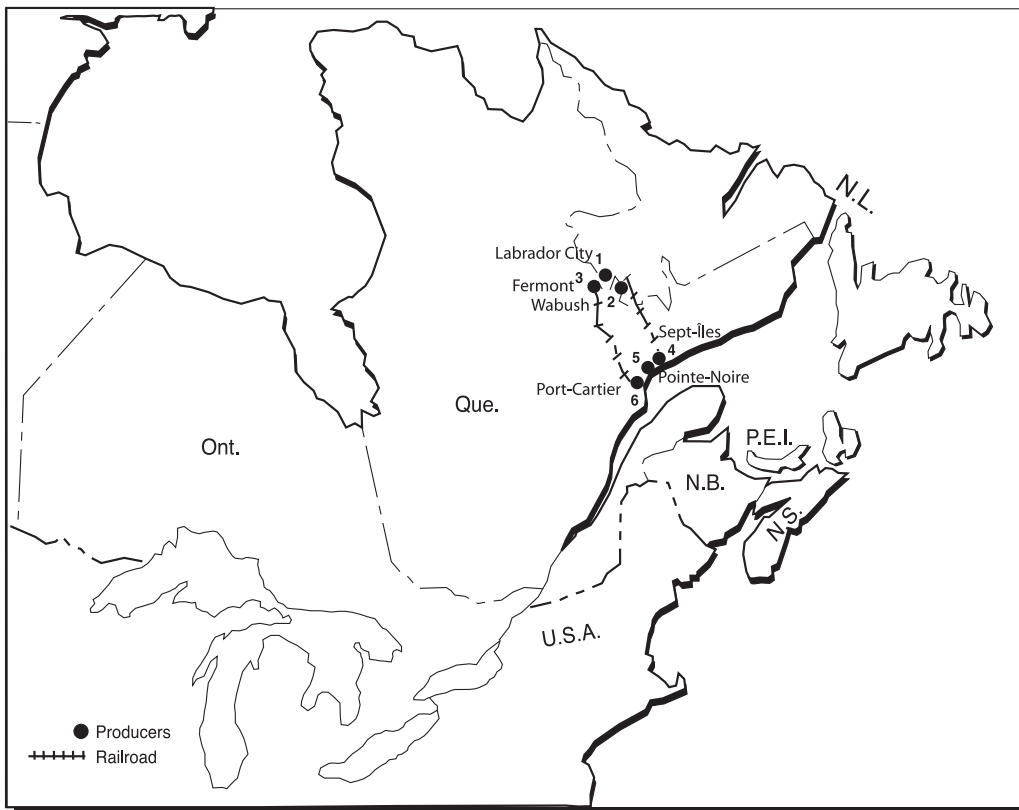
## **INTRODUCTION**

There are two aspects to iron ore demand: quantity and quality. Since the major trade item is in mineral rather than metallic form, there are many chemical and physical variants of iron ore, but they all serve the same purpose – providing the iron component of steel. Steel production in turn is the driving force for almost all iron ore demand. However, technological changes at all stages from iron ore mining to the production of finished steel have been major factors in determining the quantities and the properties of the iron ore demanded. 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 arc furnaces, which are charged with scrap and/or direct reduced iron (DRI) at the mini-mill plants. In spite of the introduction of many new materials in this century, worldwide steel industry growth has tended to average about 1% per year over the long term and this trend is expected to continue. However, the growing use of electric arc furnace (EAF) technology may slow the growth in demand for iron ore as 51% of the iron units currently used to make steel in North America come from scrap, an increase of about 6% over six years.

## **CANADIAN DEVELOPMENTS**

Iron ore is one of Canada's single most important mineral products in terms of both tonnage and value. Since the closure in 1998 of the Algoma Iron Ore Division near Wawa, Ontario, nearly all of Canada's iron ore production has been concentrated in the Labrador Trough, a major geological belt extending through northern Quebec and Labrador. Canada's production in this area (Figure 1) comes from three mining operations owned by **Iron Ore Company of Canada (IOC)**, **Quebec Cartier Mining Company (QCM)**, and **Wabush Mines**. The remaining production comes from the by-product recovery of magnetite from two base-metal smelters in British Columbia.

**Figure 1**  
**Iron Ore in Canada, 2002**



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)

In 2002, as a result of the strengthening global economy, Canada's iron ore shipments reached 30.97 Mt, an increase of 14.2% compared to the previous year. In line with this growth, the value of Canada's production increased by 17.1% to \$1.39 billion. Likewise, Canada's iron ore exports registered a 17.1% hike to reach 25.8 Mt, with the pellet market registering an increase of 14.5%, while the concentrate market fared even better, increasing by 24.1%.

Exports account for more than three quarters of Canada's iron ore shipments with Germany and the United States

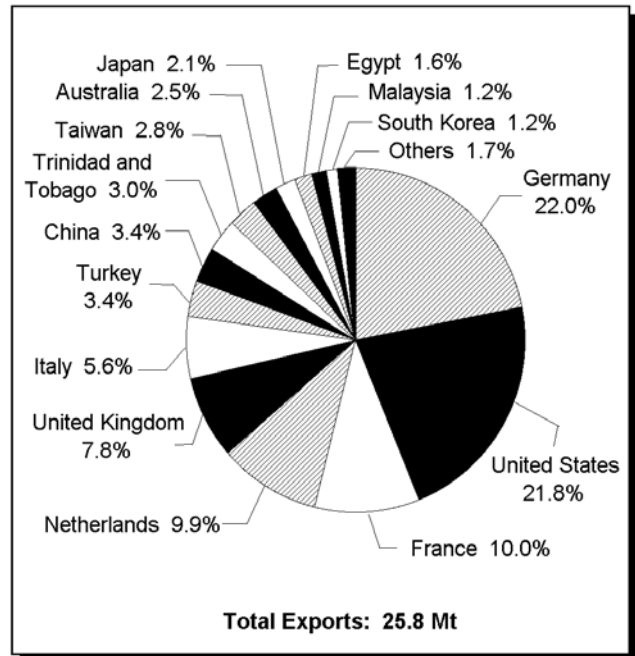
each accounting for about 22% of Canadian exports while European destinations as a whole account for close to 60% of all shipments of Canadian iron ore. The Canadian industry is, therefore, very sensitive to competition from U.S. mines in the North American market and to competition from countries that ship to the European market. Trade between the United States and Canada is a case in point in 2002 whereby Canada's exports to the United States grew from 4.5 to 5.6 Mt while Canada's imports from the United States also grew from 5.8 to 6.8 Mt, making Canada a net importing country from the United

States. In 2002, the hike in Canadian exports was brought about by increased demand, mostly from European countries, such as France, Germany, the Netherlands and Turkey, and from China, Malaysia and Egypt. On the other hand, Canadian shipments to South Korea, Japan, Italy, Belgium, the United Kingdom (U.K.), and Trinidad and Tobago were adversely affected.

Since acquiring **IOC** in August 2000, Rio Tinto plc (Rio Tinto) has been active in upgrading the Quebec and Labrador installations, as well as its load and haul fleet. In 2002, despite a five-week shut-down, IOC produced 14.7 Mt of ore of which 11.6 Mt were fluxed pellets. The company started the implementation of a major cost reduction program aimed at cutting \$120 million by 2005. It also initiated a tailings management program to comply with the new federal Metal Mining Effluent Regulation (MMER). Under this program, IOC will build a dyke to confine its tailings in Wabush Lake and to comply with a suspended solids effluent criterion of 15 mg/L. The first phase of that project is scheduled for completion by 2007.

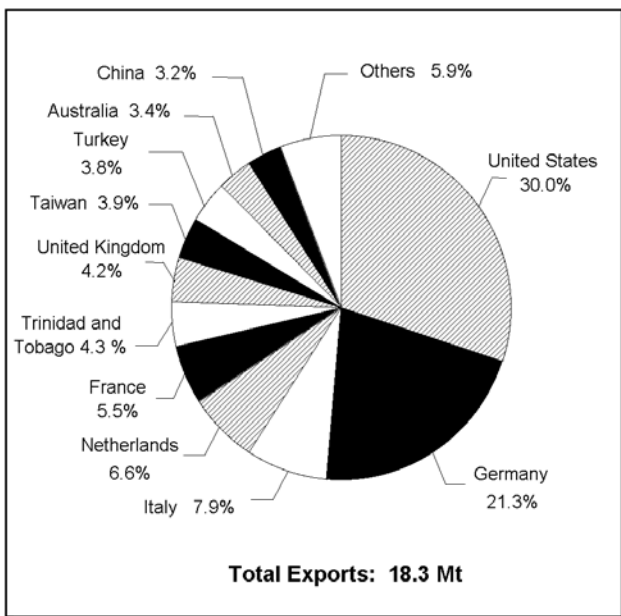
Although details of the agreement were not made public by the end of the year, **QCM** (50:50) co-owners, CAEMI Mineração e Metalurgia S.A. (CAEMI) and Dofasco Inc., announced in December 2002 that they had reached a deal with unnamed investors to sell part of their respective share in the company. The inflow of capital will be used by QCM to finance \$350 million of development work

**Figure 2**  
Canadian Iron Ore Exports By Country, 2002



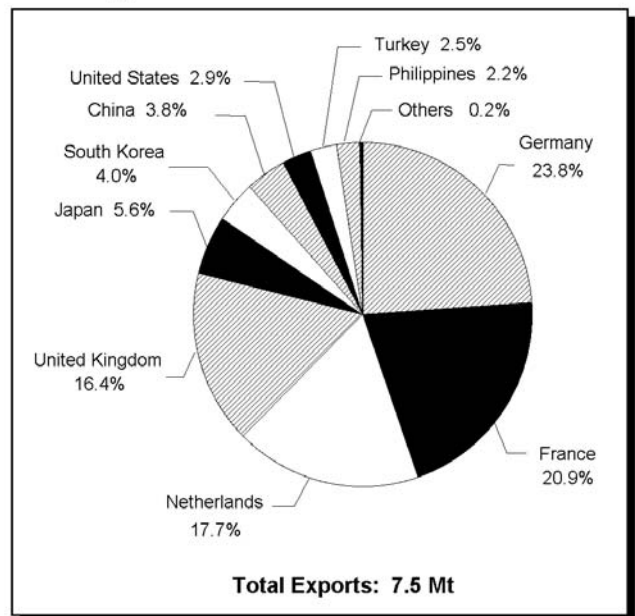
Source: Statistics Canada.

**Figure 3**  
Canadian Iron Ore Pellet Exports By Country, 2002



Source: Statistics Canada.

**Figure 4**  
Canadian Iron Ore Concentrates Exports By Country, 2002



Source: Statistics Canada.

related to stripping heavy rock overburden to get open-pit access to higher-grade ore and to ensure continued operation of the mine at a capacity of 12 Mt for the next 15 years. Dofasco's future cash obligations to finance QCM will not exceed \$34.5 million until 2010. Affected by reduced sales, QCM shut down its Mt. Wright operation for six weeks early in the year.

Following up on the strategy it initiated at the end of 2001 in response to changes in the marketplace, **Wabush Mines** operated only two of its three production lines in 2002, effectively scaling down its production level from 6.2 to 4.5 Mt. This resulted in the company producing just under 4.6 Mt of ore in 2002, roughly the same amount as in the previous year. To help improve its competitiveness on a global scale, Wabush Mines underwent a cost reduction and restructuring program during the year. It also proceeded with an important capital investment to address an ongoing operating concern regarding excess water in the pit due to the increasing depth of the operations. The Deep Well dewatering program consists of 11 wells designed to remove some 12 500 gallons per minute from the pit floor. The company estimates that the program will permit dry mining for a period of approximately two years.

## INTERNATIONAL DEVELOPMENTS

Preliminary data indicate that, following an upsurge in demand from the steel industry, which registered a 5.5% hike in pig iron production, world iron ore production increased by 7.6% in 2002 to reach 1002.3 Mt,<sup>1</sup> the highest production level ever reached by the industry. Brazil, Australia and China remained the world's largest iron ore producers, accounting for over half of this total. Nonetheless, while all producing countries registered production increases, the highest incremental production increases (of significance) were Brazil (14.7%), Canada (14.2%), the United States (12.4%), India (9.8%), Kazakhstan (9.4%), and Ukraine (7.7%).

Likewise, seaborne trade in iron ore increased 5.5% to 479 Mt in 2002 and was particularly vigorous in the second half of the year. Australia maintained its position as the world's number one iron ore exporting country with exports totalling 185.0 Mt, closely followed, as usual, by Brazil with 169.0 Mt. However, exporting countries that improved their track record the most in 2002 include Brazil and Canada followed by Australia, Chile, Mauritania and Sweden.

<sup>1</sup> A conversion factor was applied to China's production so that its % Fe content is about equal to that, on average, in the rest of the world.

### WORLD IRON ORE PRODUCTION

	2001	2002
	(000 t)	
Brazil	208 700	239 400
Australia	181 100	187 200
China (1)	102 600	108 800
India	79 200	87 000
Russia	82 500	84 236
Ukraine	54 679	58 897
United States	45 800	51 500
South Africa	34 800	36 500
Canada	27 119	30 968
Venezuela	19 000	20 900
Sweden	19 500	20 300
Kazakhstan	14 100	15 423
Mexico	11 500	12 000
Iran	10 300	11 300
Mauritania	10 300	9 600
Others	30 200	28 300
<b>Total</b>	<b>931 398</b>	<b>1 002 324</b>

Sources: Natural Resources Canada; Macquarie Equities Research; UNCTAD.

(1) A conversion factor was applied to China's production so that its % Fe content is about equal to that, on average, in the rest of the world.

On the demand side, Asia remained the world's most dynamic import market – posting a 6.9% increase over 2001 – where most country economies improved in 2002. Led by Japan, which is the world's largest importer of iron ore (129.1 Mt), the region is nonetheless driven by economies involved in large infrastructure development programs such as in China (111.5 Mt) and South Korea (42.0 Mt). Demand in European Union countries and in Europe in general remained depressed, especially in the U.K., but some improvements were noted in France and Germany. North American overall demand for iron ore pellets remained depressed as both the United States' and Mexico's pig iron production decreased respectively by 4.3% and 8.6% while Canada's increased by 3.4%. Despite this, North American crude steel production increased by 3.4% as more steel was produced using EAF technology.

### People's Republic of China

China, the largest producer of iron ore in the world – before the application of a conversion factor to bring its iron content on par with that of other world producers – has tremendous reserves of low-grade iron ore. However, the government's decision to stop subsidizing mines, increasing production costs, and a lack of investment to keep mines operating efficiently resulted in the closure of uneconomic operations and the steady decrease since 1997 of China's domestic iron ore production. On account of

this, the country turned to foreign suppliers to satisfy a large part of the iron ore requirements of its steel industry engaged in manufacturing the materials needed to develop the country's infrastructure. China even invested in the development of mines in Australia and Peru in recent years to ensure future supplies. In 2002, China's iron ore supplies were mostly sourced from Australia (38.4%), Brazil (26.7%), India (20.2%) and South Africa (9.2%). However, India and Brazil were successful in gaining market share from Australia in 2002 as a result of the latter's production capacity limits, the European market's lower demand on Brazil's iron ore in recent years, and a reduction in freight rates from Brazil to Asia, which makes the higher-quality Brazilian ore more affordable for consumers who want to blend it with their lower-grade ores.

## Brazil

Companhia Vale do Rio Doce's (CVRD) acquisitions in recent years of Ferteco Mineração, SA Mineração da Trindade and 50% of CAEMI, giving it direct or indirect control over an estimated 95% of Brazil's iron ore industry, kept the company busy reorganizing in 2002. Still unresolved at the end of the year was the decision to incorporate Ferteco into CAEMI to benefit from the synergies of a joint operation of Ferteco and Minerações Brasileiras Reunidas (MBR), 85% owned by CAEMI. In June 2002, taking advantage of the recovering pellet market, CVRD commissioned a 6.0-Mt-capacity pellet plant in Sao Luis that will bring its total capacity to 46.6 Mt.

To keep pace with a growing market, CVRD intends to invest \$6 billion in new projects by 2007 aimed at doubling its exports. Key to this expansion will be CVRD's plan to increase the handling capacity at the company's shipping terminals starting in 2004 with the opening of the No. 3 pier at its Sao Luis, Maranhao terminal, which will boost the terminal's all-cargo shipping capacity from 56 Mt to 70 Mt. In a drive to replace mines near exhaustion, such as the Timbopeba and the Corrego do Meio mines, the company plans to expand iron ore production capacity at its Carajas operation in the Amazon from 55 Mt to 70 Mt for 2005, and by 3 Mt at its Gonco Soco mine in the Minas Gerais area for 2004. These expansions will be complemented by two greenfield mine developments in Minas Gerais: the Fabrica Nova mine in 2005 and the Brucutu mine in 2006 with a capacity of 13 Mt and 12 Mt, respectively. Ferteco, on the other hand, is setting up a new \$150 million, 4-to-5-Mt/y pellet plant at its Fabrica mine, which will boost its capacity to 30 Mt. Finally, work on a \$38 million project to upgrade by 10% to 13.8 Mt the pellet capacity of the Samarco Mineração SA plant, a 50:50 CVRD-BHP Billiton joint venture, should be finalized by April 2003. Samarco's pellet production reached 12.3 Mt in 2002, of which 37% was shipped to China. CVRD expects to increase its 2003 output by 4-5%.

MBR, Brazil's second largest iron ore producer, is about two thirds through a long-term development plan to replace mines and expand its production from 29 Mt in 2002 to 37 Mt in 2007. Other than production from MBR's flagship operation, the Pico Complex, which produced 11.6 Mt of mostly hematite ore in 2002, the company is counting on production from Vargem Grande and Capitaio do Mato, as well as on new production from the Tamandua Complex (2002) and the Capao Xavier mine (2003), to replace depleted reserves at the Mutuca mine (2001) and the Aguas Claras mine (October 2002).

## Australia

Australia, the world's largest iron ore exporter, produced 187.2 Mt of ore in 2002, a 3.4% increase over 2001. This production is essentially controlled by Rio Tinto (47.3%), BHP Billiton Plc (40.0%), Mitsui & Co., Ltd. (6.0%), and Portman Ltd. (2.3%). Rio Tinto's share of Australia's iron ore production comes from its wholly owned Hamersley Iron Pty., Ltd. operations and its 53% share in Robe River Mining Co. Pty Ltd. In 2002, despite strong demand from China, and from Japan and South Korea for Yandi fines, Hamersley's output decreased by 2.5%. However, drawing from stockpiles at its operations, which include the Mt. Tom Price, Paraburdoo, Marandoo, Brockman No. 2, and Yandicodgina mines, and its 60% share of the Chanar mine, the company increased its sales by about 4.8% to 68.5 Mt.

Building on the start-up in June 2002 of the West Angelas deposit, Robe River increased its production by 16.8% to 35.9 Mt and its shipments by 13.8% to 35.4 Mt. Developed at a cost of about \$700 million, the West Angelas mine started producing at a 7-Mt capacity and is expected to reach its designed capacity of 20 Mt by 2007. Project costs included the expansion of rail links and of the Cape Lambert port facilities to increase its handling and shipping capacity from 32 to 50 Mt.

BHP Billiton's iron ore production in Australia increased by 3.9% to 63.1 Mt in 2002, with ore coming from its 85% ownership of the Mt. Newman (21.8 Mt), Goldsworthy (6.8 Mt), and Yandi (29.3 Mt) mines and from its wholly owned Jimblebar project (5.3 Mt). In order to deal with additional ore production capacity at the Yandi mine, where a 4-Mt capacity for lump product was introduced in 2002, the company realized efficiency improvements by increasing its ship-loading capacity at the company's port facilities at Nelson Point and by increasing its rail capacity by optimizing the tonnage in rail cars through a new loading system. BHP Billiton also pursued its larger \$540 million PACE project to enable it to increase its export capacity by 10 Mt and to handle additional ore production from its \$328 million, Area C, 15-Mt/y Marra Mamba ore project, scheduled for commissioning in October 2003. The first stage of the PACE project is set to increase BHP

Billiton's capacity to 81 Mt by mid-2004 while further stages could push capacity to more than 90 Mt.

Other projects under development in Australia include the Hope Downs project owned (50:50) by South Africa's Kumba Resources limited and Australia's Hancock Resources Limited. Slated to begin production in 2006 at an initial output of 5 Mt, this operation will have a 25-Mt capacity and will produce Marra Mamba ore with a 38:62 lump-to-fines ratio. However, the project faced a setback in 2002 with the ruling by the Supreme Court of Western Australia denying access to BHP Billiton's Mt. Newman rail line, which would have saved the project about \$250 million in infrastructure costs.

## India

Directly competing for market share with Australia – as shown by its 33% increase in exports to China in 2002 over the previous year – India's iron ore industry has been steadily expanding over the past decade. This tendency may even accelerate in coming years with the gradual liberalization of exports from India as shown by the respective hikes in exports of 13.3% and 12.6% in 2001 and 2002. About 52% of India's iron ore production is currently controlled by public sector units such as the National Mineral Development Corp., Kudremukh Iron Ore Co. Ltd. (KIOCL), the Steel Authority of India Ltd. (SAIL), and Orissa Mining Corp., while Minerals & Metals Trading Corp. (MMTC), India's state trader, canalizes 64%+ Fe iron ore exports. However, the expected privatization of MMTC and the depletion of reserves at KIOCL's operation near Mangalore by the end of 2005 will reduce the state's hold on the industry. In light of the country's excellent high-grade ore reserves and liberalizing trade rules, prospects for further exports look bright. However, improvements to port and rail facilities, as well as the development of new mines, will be required.

## Russia

Pursuing the revival of its industry initiated by the devaluation of the rouble in 1998, which gave it a competitive cost advantage, Russian production of iron ore increased by 1.4% to 84.2 Mt in 2002 and included 29.8 Mt of pellets. Russia's iron ore comes from a few large producers such as Lebedensky GOK (18.4 Mt), Mikhailovsky GOK (15.1 Mt), Stoilensky GOK (12.6 Mt), and Kachkanarsky GOK (7.8 Mt), and from numerous mines with a capacity of less than 2 Mt each. Roughly 70% of this production is used domestically while the rest is exported to supply Ukraine's growing steel industry and Eastern European countries. Russia also exports significant amounts to Germany, Turkey, Finland and Norway.

## Ukraine

Responding to growing internal demand, iron ore production in Ukraine – the former Soviet Union's second largest iron ore producer – reached 58.9 Mt in 2002, an increase of 7.7% compared to 2001. Ukraine's iron ore industry comprises a dozen producers of which the largest are: Inguletsky GOK (12.4 Mt), Yuzhny GOK (7.6 Mt), Severny GOK (7.1 Mt), Novokrivorozhsky GOK (6.7 Mt), and Poltavsky GOK (6.7 Mt). In the case of Poltavsky and Severny, which are currently being privatized, their output is mostly in the form of pellets. As for Kazakhstan's production, which is essentially controlled by the Sokolov-Sarbai Mining Production Association, it increased by 8.1% in 2002 to reach 15.4 Mt, including 7.3 Mt of pellets.

## United States

The U.S. iron ore industry was also busy reorganizing as Cleveland-Cliffs Inc. acquired Algoma Steel's 45% interest in the Tilden mine, increasing its ownership in the latter to 85%. During the year, Cliffs also increased its ownership in the Hibbing mine to 23% and in the Empire mine to 79% by acquiring LTV Steel Mining Company's and Ispat Inland Inc.'s respective 25% and 19% interest in the latter mine. These transactions may lead to a combination of the operations of the Tilden and Empire mines before the end of 2003 and result in a more efficient and cost-competitive mining operation. Cliffs' share of iron ore pellet production in 2002 from the mines it manages (Empire, Tilden, Hibbing, Northshore and Wabush) was 13.3 Mt despite the extended shut-down of the Empire mine that began early in the year. Cliffs is projecting that total mine production will increase by close to 17% in 2003 to 29.6 Mt. Meanwhile, the Minntac iron ore mine, the United States' largest producer with a 16-Mt pellet capacity, completed a six-year \$75 million upgrade of its concentrator facility in May 2002 to improve its cost-effectiveness.

## Republic of South Africa

Consolidation may also start to occur in the South African iron ore industry following the Anglo American plc (Anglo) acquisition in March 2002 of a 20.1% stake in Kumba Resources Limited (Kumba) and a 34.9% stake in Anglovaal Mining Limited (Avmin). With these purchases, Anglo enters the iron ore business with Kumba's ownership of the Sishen and Tabazimbi mines (25-Mt capacity) and Avmin's 53% ownership of Assmang Limited, which operates the Beeshoek mines (6-Mt capacity). South Africa's production in 2002 reached 36.5 Mt, of which about 21 Mt was exported to China (49%) and Japan (22.5%) while the rest went to Europe.

## Sweden

Luossavaara Kiirunavaara AB (LKAB), the world's fifth largest iron ore exporter, produced 20.3 Mt of ore in 2002 – including 14.0 Mt of pellets – an increase of 4.1% over the previous year. Capitalizing on the strong Chinese market, the company increased its exports by 4.4% to 14.2 Mt, of which 0.3 Mt went to China. LKAB is planning to increase its sales to China to the 1-Mt level in 2003 and in the mid term to a 1.0- to 1.5-Mt level. The company reports having completed a major investment program to increase its pellet capacity to 16.3 Mt and to extend the life of its two underground mines, including the development of a new main level at the Malmberget mine and the development of the Kiruna orebody under Lake Luossajavari.

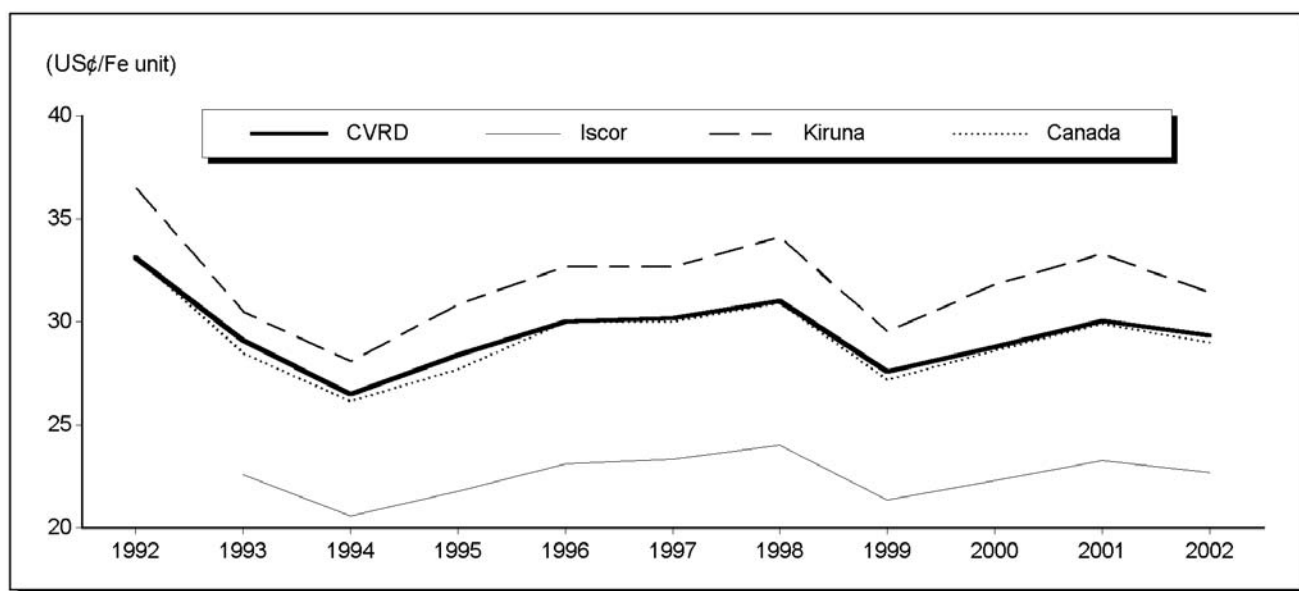
## PRICES

Agreements on iron ore prices were finally settled on the European and Japanese markets at the end of May 2002, the latest the industry has ever experienced. Despite indications that demand for iron ore was recovering globally and that strong demand from Asia, particularly China, would exert some pressure on the availability of supplies, iron ore producers agreed on a price reduction for 2002.

This year's iron ore price negotiations were first settled between Brazil's CVRD and European steelmakers, followed by Australian suppliers and Japanese mills who settled on a similar accord. For concentrate bound for Europe and Japan, the price decrease was set at around 2.4% for most grades, although Canadian and Swedish concentrate was reduced by 3.01% and 5.62%, respectively. Similarly, the price of pellets bound for Europe and Japan decreased in the range of 5.47-7.64% while the price of lumps fell by 5.00%.

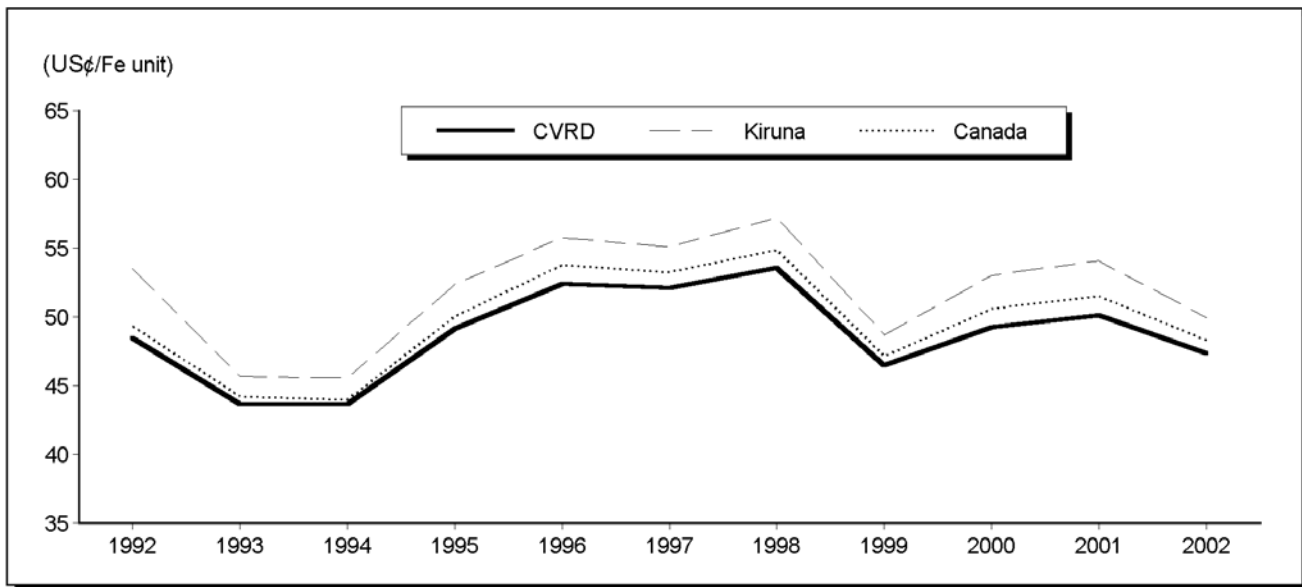
Negotiations for 2003 iron ore deliveries got under way in mid-December 2002 and appear set to result in a price hike in the 5-7% range. Aspects favouring this outcome include the steel price increases witnessed in 2002 and China's increasing iron ore demand, which may result in a scarcity of supplies on the markets. However, uncertainties related to the vigour of the economic recovery in Europe and in North America, and the impact of a potential military intervention in the Middle East, may limit upward pressure on prices. In any case, as outlined in Figure 7, any price increase agreed upon, minimized by the application of the inflation rate, will require iron ore producers to pursue their cost-cutting measures to remain competitive.

**Figure 5**  
Iron Ore Price, Fines Bound for Europe, 1992-2002



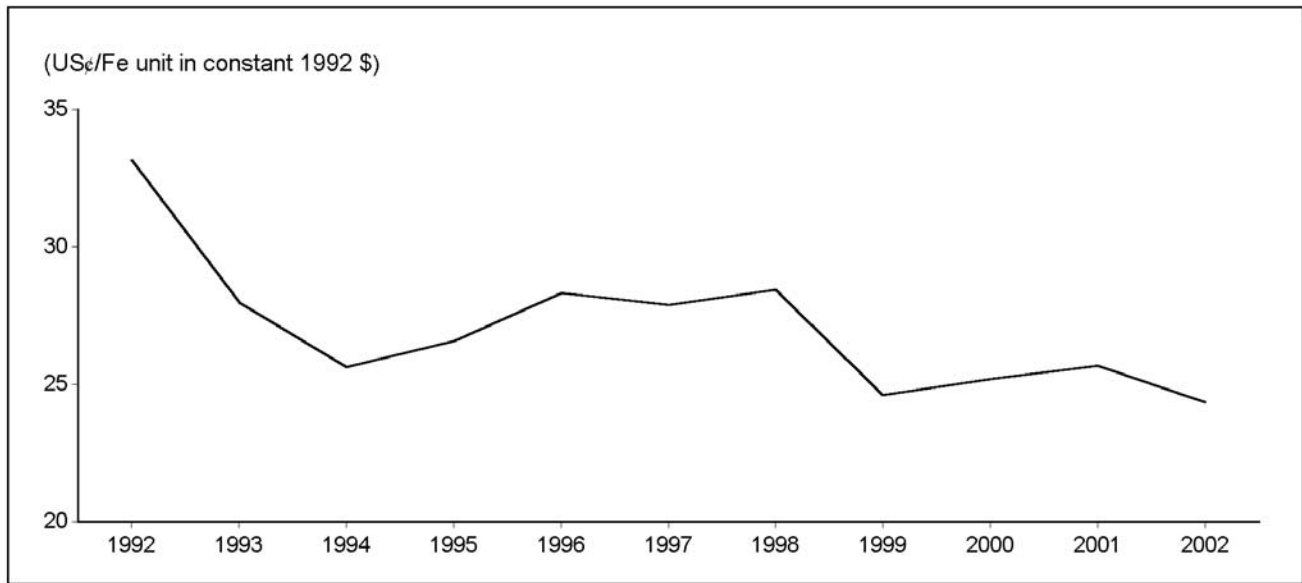
Sources: *The Tex Report*; UNCTAD.

**Figure 6**  
**Iron Ore Price, Pellets Bound for Europe, 1992-2002**



Sources: *The Tex Report*, UNCTAD.

**Figure 7**  
**Iron Ore Price Variations, Canadian Concentrate Bound for Europe, 1992-2002**



Sources: Natural Resources Canada; *The Tex Report*, UNCTAD.



## OUTLOOK

The consolidation and restructuring of the global iron ore industry witnessed in the past two years should continue during the coming years, enabling producers to improve their competitiveness through economies of scale. This will help the iron ore and steel industry preserve its market share as a supplier of low-cost, versatile, high-performance material of choice for use in a variety of applications.

Any change in the economic situation in Asia is expected to have a marked impact on steel markets and, consequently, on iron ore use. China, one of the fastest-growing economies in the world, is expected to continue to look to foreign suppliers to satisfy a large part of its iron ore requirements. Chinese imports of iron ore rose from 14.3 Mt in 1990 to over 111.5 Mt in 2002, representing an annual growth rate of over 18%. The development of a more modern market economy in China and the demand for higher-quality products are expected to lead that country to maintain or increase its present level of imports. Based on this situation and on increased demand from North American steel producers, world iron ore production is forecast to reach 1013 Mt in 2003, an increase of about 1%, while seaborne trade is forecast at 514 Mt.

Despite the recent appreciation of the Canadian dollar versus the U.S. dollar, which will reduce their competitiveness on international markets, Canadian producers should be able to take advantage of this increased trade. Canadian shipments of iron ore are therefore forecast to reach a level of around 32 Mt in 2003 with Wabush Mines producing in the range of 4.8 Mt in 2003, QCM in the order of 12 Mt, and IOC a level of 15.8 Mt.

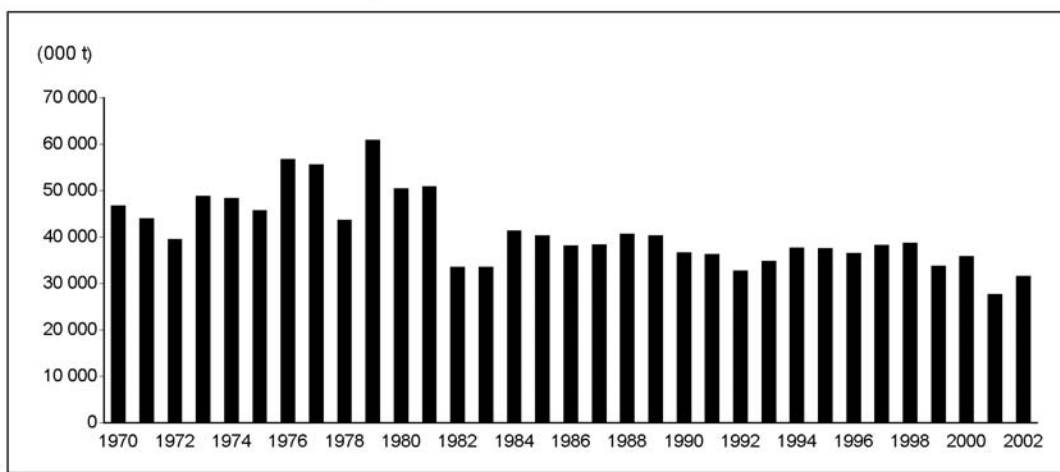
In the short term, the reduced price spread between fines and pellets and the forecast tight supply of low residual scrap, which should encourage the production of DRI and iron carbide, will boost demand for pellets, especially DRI-grade pellets. This situation and the long-term trend for increased pellet use to supply the growing use of EAF in steelmaking may cause Canadian producers to re-evaluate their investment decisions and reactivate pellet capacity, such as IOC's Sept-Îles plant. Nonetheless, the Canadian industry will continue to face challenges to remain competitive because of the lower grade of Canadian ore relative to several competitors on the international market. So far, however, as indicated in Figure 8, the companies have been able to meet the challenge and keep a fairly even production level throughout the past decades through quality programs and restructuring.

*Notes: (1) For definitions and valuation of mineral production, shipments and trade, please refer to Chapter 64. (2) Information in this review was current as of January 1, 2003. (3) This and other reviews, including previous editions, are available on the Internet at [www.nrcan.gc.ca/mms/cmy/com\\_e.html](http://www.nrcan.gc.ca/mms/cmy/com_e.html).*

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**Figure 8**  
Canadian Iron Ore Production, 1970-2002



Source: Natural Resources Canada.

**TABLE 1. CANADA, IRON ORE PRODUCTION AND TRADE, 2001 AND 2002**

Item No.	2001		2002 (p)	
	(tonnes) (1)	(\$000)	(tonnes) (1)	(\$000)
<b>PRODUCTION</b> (mine shipments)				
By province				
Newfoundland and Labrador	17 486 322	798 238	19 376 953	895 477
Quebec	9 560 479	x	11 500 000	x
British Columbia	72 480	x	92 314	x
Total (2)	27 119 281	1 188 928	30 969 267	1 391 692
<b>IMPORTS</b>				
2601.11	Iron ore concentrates, non-agglomerated			
United States	91 194	2 196	24 535	661
Peru	3	...	26 190	557
Spain	-	-	164	6
France	35	1	112	5
Germany	29	1	111	2
Other countries	334	12	35	...
Total	91 595	2 210	51 147	1 231
2601.12	Iron ore, agglomerated			
United States	5 814 337	332 368	6 793 385	375 266
Other countries	2	...	151	7
Total	5 814 339	332 368	6 793 536	375 273
<b>EXPORTS</b>				
2601.11	Iron ore concentrates, non-agglomerated			
Germany	1 697 483	47 215	1 794 390	54 560
Netherlands	830 757	24 200	1 332 628	37 544
France	535 186	11 387	1 576 558	36 118
United Kingdom	1 124 106	29 838	1 231 630	31 906
Japan	822 119	21 802	420 040	11 240
Turkey	-	-	186 491	9 550
China	164 980	4 666	288 218	8 235
Philippines	57 979	986	168 685	7 621
South Korea	482 153	13 807	298 379	7 600
United States	339 143	10 602	220 230	5 703
Australia	15 703	443	14 998	418
Total	6 069 609	164 946	7 532 247	210 495
2601.12	Iron ore, agglomerated			
United States	4 187 959	195 991	5 374 954	242 367
Germany	3 245 483	157 796	4 061 355	197 870
Italy	1 691 891	83 015	1 432 491	71 192
Netherlands	955 690	48 791	1 199 889	59 904
France	251 732	12 625	999 320	50 207
Trinidad and Tobago	1 253 566	73 983	777 590	44 074
United Kingdom	1 213 452	57 934	764 134	36 118
Turkey	292 342	14 433	682 046	34 045
Taiwan	659 138	31 411	713 034	33 670
Australia	952 449	44 553	618 303	30 946
China	427 394	21 453	586 988	29 328
Egypt	136 055	6 495	415 369	18 290
Malaysia	148 571	7 912	306 354	15 149
Switzerland	59 801	2 855	139 005	6 635
Japan	80 871	3 988	131 050	6 582
Hungary	-	-	42 099	1 999
Qatar	-	-	35 533	1 798
Saudi Arabia	-	-	35 389	1 791
Belgium	308 148	14 709	-	-
South Korea	45 897	2 289	-	-
Philippines	85 145	2 725	-	-
Portugal	-	-	-	-
Total	15 995 584	782 958	18 314 903	881 965

TABLE 1 (cont'd)

Item No.	2001		2002 (p)	
	(tonnes) (1)	(\$000)	(tonnes) (1)	(\$000)
<b>EXPORTS (cont'd)</b>				
Total exports, all classes				
Germany	4 942 966	205 011	5 855 745	252 430
United States	4 527 102	206 593	5 595 184	248 070
Netherlands	1 786 447	72 991	2 532 517	97 448
France	786 918	24 012	2 575 878	86 325
Italy	1 691 891	83 015	1 432 491	71 192
United Kingdom	2 337 558	87 772	1 995 764	68 024
Trinidad and Tobago	1 253 566	73 983	777 590	44 074
Turkey	292 342	14 433	868 537	43 595
China	592 374	26 119	875 206	37 563
Taiwan	659 138	31 411	713 034	33 670
Australia	968 152	44 996	633 301	31 364
Egypt	136 055	6 495	415 369	18 290
Japan	902 990	25 790	551 090	17 822
Malaysia	148 571	7 912	306 354	15 149
Philippines	143 124	3 711	168 685	7 621
South Korea	528 050	16 096	298 379	7 600
Switzerland	59 801	2 855	139 005	6 635
Hungary	–	–	42 099	1 999
Qatar	–	–	35 533	1 798
Saudi Arabia	–	–	35 389	1 791
Belgium	308 148	14 709	–	–
Portugal	–	–	–	–
Total	22 065 193	947 904	25 847 150	1 092 460

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

– Nil; . . . Amount too small to be expressed; (p) Preliminary; x Confidential.

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

TABLE 2. CANADA, IRON ORE SHIPMENTS, 1997-2002

Company and Location	Ore Mined	Product Shipped	1997	1998	(natural (wet))			
					1999	2000	2001	2002 (p)
Algoma Ore Division Algoma Steel Inc. Wawa, Ontario	Siderite	Sinter (1)	795	651	–	–	–	–
Iron Ore Company of Canada Schefferville, Quebec	Hematite, goethite and limonite	Direct shipping	–	–	–	–	–	–
Carol Lake, Newfoundland and Labrador	Specular hematite and magnetite	Concentrate	4 678	5 172	3 983	3 955	3 415	3 151
		Acid pellets	..	..	2 408	..	..	..
		Fluxed pellets	11 372	12 248	3 190	11 466	9 908	11 566
		Limestone pellets	..	..	3 870	..	..	..
		Direct reduced pellets	..	..	211	..	..	..
		Chips	..	..	..	..	..	..
Loadstone Limited Newfoundland and Labrador	Magnetite	Concentrate	100	–	–	–	–	
Quebec Cartier Mining Company Mt. Wright, Quebec	Specular hematite	Concentrate	7 159	6 757	6 304	6 163	(r) 3 465	4 020
		Acid pellets	3 795	3 577	2 820	..	(r) 2 155	1 600
		Self-fluxed pellets	4 324	2 824	3 036	8 234	(r) 2 023	2 586
		Low-Si pellets	225	1 638	1 591	..	(r) 1 085	3 045
		Low-Si self-fluxed pellets	–	103	1 045	..	(r) 1 051	965
Wabush Mines Wabush, Labrador and Pointe-Noire, Quebec	Specular hematite and magnetite	Acid pellets	3 440	3 127	3 223	5 983	2 945	3 455
		Fluxed pellets	2 257	2 518	2 009	..	1 499	1 024
		Concentrate	..	..	35	..	..	..
		Chips	..	..	..	..	110	81
British Columbia producers	Magnetite	Concentrate	100	102	92	102	(r) 72	92
Total			38 245	38 717	33 790	35 903	(r) 27 728	31 585

Source: Natural Resources Canada.

– Nil; . . . Not available; (p) Preliminary; (r) Revised.

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

**TABLE 3. RECEIPTS, USE AND INVENTORIES OF IRON ORE AT CANADIAN IRON AND STEEL PLANTS, 2001 AND 2002**

	2001	2002
	(000 tonnes)	
Receipts imported	5 974	6 924
Receipts from domestic sources	6 444	6 252
<b>Total receipts at iron and steel plants</b>	<b>12 418</b>	<b>13 176</b>
Use of iron ore	12 381	13 057
Inventory at docks, plants, mines and furnace yards, December 31	10 420	7 625
Inventory change	1 602	-2 795

Source: American Iron Ore Association.

**TABLE 4. SELECTED PRICES OF IRON ORE BOUND FOR JAPAN AND EUROPE, 1988-2002**

Ore	Market	Source	1988	1990	1992	1994	1996	1998	2000	2001	2002
(US\$/Fe Unit Dmt, f.o.b.)											
Fines (including concentrate)	Europe	CVRD	23.50	30.80	33.10	26.47	30.00	31.00	28.79	30.03	29.31
		Iscor	20.55	24.75	—	20.60	23.10	24.01	22.30	23.26	22.70
		Kiruna	26.00	35.70	36.50	28.10	32.70	34.10	31.83	33.30	31.43
	Japan	Carol Lake	23.69	31.78	33.15	26.15	30.00	30.90	28.60	29.90	29.00
		Mt. Wright	23.69	31.78	33.15	26.15	30.00	30.90	28.60	29.90	29.00
		CVRD	20.90	27.38	28.11	22.65	25.89	26.89	25.01	26.06	25.45
		Iscor	17.75	23.62	24.24	19.21	21.55	20.65	20.80	21.69	21.17
		Hammersley (2)	23.31	30.54	31.35	25.26	28.33	29.45	27.35	28.52	27.83
		Carol Lake	19.93	26.11	27.26	21.96	24.63	25.60	23.78	24.80	24.21
Lump	Europe	Iscor	23.50	33.00	32.29	28.00	32.13	(r) 33.07	31.41	32.42	30.80
		Hammersley (1)	33.15	49.97	48.28	40.28	46.82	47.94	45.56	47.21	42.73
	Japan	CVRD	21.89	29.22	29.00	24.38	27.63	28.44	27.02	27.89	26.50
		Iscor	21.99	30.21	30.27	26.15	30.50	31.40	29.36	30.31	28.79
Pellets	Europe	CVRD	36.70	51.60	48.47	43.64	52.40	53.56	49.24	50.10	47.36
		Kiruna	41.15	59.00	53.48	45.60	55.80	57.20	53.00	54.08	49.95
		Carol Lake	37.15	52.58	49.35	44.00	53.80	54.88	50.60	51.53	48.30
		Mt. Wright	37.15	52.58	49.35	44.00	53.80	54.88	50.60	51.53	48.30
	Japan	CVRD	35.04	48.50	45.57	41.03	49.26	50.34	46.29	47.10	44.52
		(Nibrasco)	34.17	45.90	43.12	38.83	46.62	47.65	43.80	44.57	—
		Savage River	34.17	45.90	43.12	38.83	46.62	47.65	43.80	44.57	—

Sources: *The Tex Report*; *Skills Mining Review*; UNCTAD.

— Nil; Dmt Dry metric tonne; f.o.b. Free on board; (r) Revised.

(1) c.i.f. Rotterdam. (2) f.o.b. Dampier.

Note: 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.