Cement

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Shipments of cement in 1995 were estimated to be 10.7 Mt valued at $876.5 million, an increase of 1.3% in volume compared to 1994, based on preliminary figures. However, the overall demand for cement in Canada has been weaker, except in the Atlantic region as a result of engineering-related expenditures for the Hibernia project and the fixed-link crossing between New Brunswick and Prince Edward Island. Overall construction activity has been weaker, mainly as the result of a drop of almost 30% in housing starts. The $6 billion cost-shared program for infrastructure renewal, supported by all three levels of government, has contributed to total activity. Reported kiln capacity in 1994 was about 14.8 Mt, with about 13.4 Mt active, according to the most recent figures available.

THE CANADIAN INDUSTRY

The Canadian cement industry is diversified and mainly integrated with the primary construction materials and products sectors. Many cement manufacturers also supply ready-mix concrete, crushed stone aggregates, and concrete products such as slabs, bricks and pre-stressed concrete units. Restructuring during recent years has tended to result in a decentralization of operations and greater foreign control, now estimated to account for about 80% of the industry's capacity. Major international companies include: Holderbank Financière Glaris Ltd., headquartered in Zurich, which controls St. Lawrence Cement Inc.; Lafarge Corporation (part of the Lafarge Coppée Group, headquartered in Paris), which indirectly controls Lafarge Canada Inc.; Heidelberger Zement AG, of Germany, which in 1995 purchased controlling interests in both Inland Cement Limited and Tilbury Cement Limited from S.A. Cimenteries CBR; and Italcementi S.p.a., which controls Société des Ciments Français (SCF), of France, which in turn owns both Essroc Canada Inc. and Ciment Québec Inc. SCF now uses the name "ESSROC" to identify all of its holdings in Canada and the United States. (Accordingly, ESSROC Canada Inc. now operates the former Lake Ontario Cement Limited plant.)

Lafarge Corporation announced plans to build a new $95 million cement plant on the site of its Richmond, British Columbia operation. The new plant is scheduled for completion in 1998 and will result in production of about 1 Mt/y, an increase in capacity of 450 000 t/y compared to the older plant built in 1958. Overall capital costs will be lower than a "greenfield" development because existing sites and substantial equipment and infrastructure are already in place.

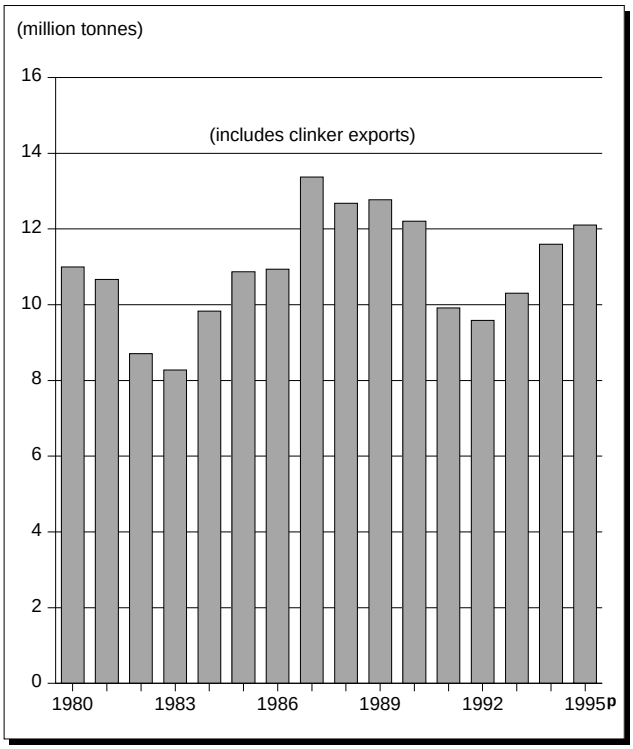
Cimbec Canada Inc. continued with plans for a 1-Mt/y cement plant at Port Daniel on the southeastern side of the Gaspé Peninsula, Quebec. The entrepreneurs have been encouraged mainly by the proximity of high-quality limestones situated near water and rail transportation. Prospective partners are being sought to participate in comprehensive feasibility studies.

Clinker-producing and finish-grinding capacities of cement plants, on a company-by-company basis, are listed in Table 2. Clinker production is more indicative of ultimate cement production capacity because clinker can be stockpiled for later use or sale. Overall output of the cement industry is best represented by total cement shipments plus clinker exports, as shown in Table 3. The average kiln capacity over a recent 10-year period (1984-94) has increased from about 340 000 t/y to 450 000 t/y; the average kiln age is reported to be about 25 years.

In **Atlantic Canada**, two cement plants obtain raw materials on site or nearby. These account for about 4% of total Canadian clinker-producing capacity. Nova Scotia and Newfoundland are now the only producers of cement in the region since Lafarge Canada Inc. retired its Havelock, New Brunswick, plant in 1988.

In **Quebec**, four clinker-producing plants and one grinding operation accounted for about 25% of national output. St. Lawrence Cement Inc. (SLC) is the dominant manufacturer of cement and a leading producer of concrete and aggregates in eastern Canada. Its major markets, in competition with Lafarge Canada Inc. and Ciment Québec Inc., are in Quebec, the Maritime provinces and the northeastern

Figure 1
Canadian Cement Production, 1980-95



Source: Statistics Canada.
p Preliminary.

United States. Considering the northeastern region of North America as a whole, there are generally four to six distribution terminals for every cement clinker plant. Expansions of stone aggregate operations and raw material reserves remain major company objectives.

In **Ontario**, clinker-producing plants account for about 45% of Canadian capacity. Lafarge Canada Inc., with operations across Canada, is the largest producer in terms of both clinker and finish-grinding capacity. Lafarge's raw materials handling is extensive; for example, limestone for its plant at Bath is quarried on site and silica is supplied from Potsdam sandstone near Pittsburgh, New York, about 65 km east of Bath. Iron oxide and gypsum are purchased from Hamilton and Nova Scotia, respectively. Lafarge's Woodstock plant obtains limestone on site, silica from Falconbridge Limited, iron oxide from Stelco Inc., and gypsum from sources in southern Ontario. At Picton, ESSROC Canada Inc. operates one of the largest cement plants in North America. In addition to the company's usual markets, the plant supplies cement and clinker to an associated company, ESSROC Materials Inc., in the states of New York and Michigan.

In **western Canada**, two companies, CBR/ Heidelberger and Lafarge Canada Inc., normally operate four clinker-producing plants in the Prairie provinces and three in British Columbia. Western Canada accounts for about 26% of clinker-producing capacity, roughly in proportion to its share of total Canadian consumption. CBR/Heidelberger affiliate Inland Cement Limited continues to ship cement from its relatively large Edmonton operation to Regina and Winnipeg for wide distribution. Most raw materials for Lafarge's Exshaw plant are from on-site sources. However, gypsum is provided by Westroc Industries Limited, while iron oxide is from IPSCO Inc. in Regina and the Oregon Steel Co. at Portland, Oregon. Lafarge's Vancouver plant at Richmond and Tilbury Cement Limited's plant at Delta use limestone from Texada Island. Lafarge's Kamloops plant is supplied from nearby reserves.

WORLD DEVELOPMENTS

Multinational companies with widespread production and distribution networks have now become much more dominant in world markets. A recent example of this is the partial consolidation of markets in the United States, Canada and Mexico, with companies competing on a regional basis. An estimated 70% of the U.S. industry is now controlled by European and Pacific Rim cement producers.

World cement production in 1994 was 1369 Mt, according to the U.S. Bureau of Mines. China ranked number one, leading all countries with 400 Mt, followed by Japan with 92 Mt and the United States with 78 Mt.

The 31st International Cement Seminar held in Phoenix, Arizona, attracted more than 650 delegates from around the world. Some production and trade-related subjects included: 1) new investments to increase North American cement capacity; 2) firmer pricing, now believed to be sustainable with continued economic recovery; and 3) the importance of supplementary cementing materials (SCMs) as an economical means of producing blended cements for "high performance" concrete.

In addition to several plant expansions and modernization projects in some regions of the United States, projects are under way in Mexico, Colombia and Venezuela to serve local demand as well as U.S. demand where possible.

A third review of the anti-dumping order against grey Portland cement clinker from Mexico, conducted by the U.S. Department of Commerce (DOC), increased anti-dumping margins from 43% to 62%. The DOC found that Cemex (Cementos Mexicanos, S.A.), Mexico's dominant cement producer and the largest cement producer in North America, will have to tender an anti-dumping cash deposit at 62% of the customs value of imports.

CONSUMPTION AND TRADE

Portland cement clinker is produced by burning, usually in a rotary kiln, an accurately proportioned, finely ground mixture of limestone, silica, alumina and iron oxide. The three most commonly used types of cement produced by most Canadian cement producers are: Normal Portland (Type I), Moderate Sulphate-Resistance Portland (Type II), and High-Early-Strength Portland (Type III).

Cement and clinker cross-border trade with the United States varies considerably from year to year depending on demand. Canadian cement production efficiencies and a lower-valued Canadian dollar continue to make Canadian cement and clinker competitive in U.S. markets. Low-cost marine transportation has influenced world trade considerably. Total U.S. imports of cement for consumption were about 15.8 Mt, or 17% of apparent consumption.

TECHNOLOGY

Energy conservation programs by the Canadian cement industry have reduced energy consumption per unit of production by about 22% since 1974. Although the number of kilns has decreased, their individual capacities have increased and the more efficient dry-process plants now account for more than 80% of total cement production. Work continues toward using cheaper fuels, improving methods for defining optimal particle sizes based on grinding, and using waste materials in kilns. The fuel mix has changed considerably away from natural gas and petroleum products toward coal and/or coke. In 1994, of 18 clinker-producing plants, 15 reported using coal and/or coke as their primary fuel. Eleven plants reported using waste as an alternate fuel or supplemental fuel, according to the Canadian Portland Cement Association (CPCA). Waste was not used as a primary fuel. In 1994, the Canadian cement industry consumed, on average, 4719 megajoules per tonne of production, of which 3709 megajoules (79%) were derived from fossil fuels (Table 2).

Suitable waste materials are an attractive alternative fuel because pyro-processing accounts for more than 80% of total energy needs, or about 30% of total production costs. In the United States and Europe in particular, the use of waste-derived fuels and spent organic solvents has grown. The waste materials generally accepted by all jurisdictions as being very satisfactory include paints and coatings, surplus oils and greases, solvents, inks, and cosmetics. In the context of sustainable development, it seems apparent that improved waste management involving combustion technology could lead to greater conservation of some non-renewable fossil fuels.

The Canada Centre for Mineral and Energy Technology (CANMET), through its Industrial Targeted Program (ITP) under the *National Energy Efficiency Act*, is developing long-term energy efficiency R&D (research and development) strategies for major industrial sectors. The cement and concrete sector study was completed in 1993 and there have been cooperative investments in energy efficiency research leading to field trials and technical transfer.

CANMET has established cooperative arrangements for investigating the properties of concrete made with a high proportion of fly ash. The work, based on CANMET's technology that allows up to 60% of Portland cement replacement by fly ash, is being funded by the Electric Power Research Institute (EPRI) of Palo Alto, California, and the Canadian Electrical Association (CEA) of Montréal. Also, Hydro-Québec is a member of the project team. Past cooperative research into supplementary cementing materials led to the production of a ground granulated blast furnace slag for use as a cementitious material in concrete. Lafarge Canada Inc. (operating a plant formerly owned by Koch Minerals of Canada Limited) now produces this type of material, often called "slag cement," at Spragge, Ontario. Granulated slag is from The Algoma Steel Corporation, Limited's plant at Sault Ste. Marie. The capacity of the Spragge plant is about 150 000 t/y, with the product being used for the complete or partial replacement of Portland cement.

In 1995, CANMET, along with the American Concrete Institute (ACI), the EPRI, the CEA, and the National Research Council of Canada (NRC), sponsored the Fifth CANMET/ACI International Conference on Flyash, Silica Fume, Slag and Natural Pozzolans in Concrete, held in Milwaukee, Wisconsin. The main topics included new developments and the need to transfer related technology as widely as possible. Also in 1995, CANMET, along with the ACI and the NRC, sponsored the Second CANMET/ACI International Symposium on Advances in Concrete Technology, which was held in Las Vegas, Nevada.

CANMET and the ACI, along with co-sponsors including the University of New Brunswick and the Canadian Portland Cement Association, are planning the Third CANMET/ACI International Conference on Performance of Concrete in Marine Environments. This conference will be held in St. Andrews-By-The-Sea, New Brunswick, in August 1996. Also in 1996, CANMET, the ACI and the NRC will sponsor the CANMET/ACI Three-Day Intensive Course On Fly Ash, Slag, Silica Fume, Other Pozzolanic Materials and Superplasticizers in Concrete, to be held in Ottawa, Ontario.

In recent years there have been many new developments in the understanding and use of fly ash in concrete. A new, second edition of *Fly Ash in Concrete*, which includes 12 chapters and more than 300 pages covering the period 1986-94, is available from Natural Resources Canada.

Moderate Sulphate-Resistance Cement (Type II) and Low-Heat-of-Hydration Cement (Type IV), designed for concrete poured in large masses, as in dam construction, are manufactured by several companies in Canada. Masonry cement (a generic name) includes such proprietary product names as Mortar Cement, Mortar Mix (unsanded), Mason's Cement, Brick Cement, and Masonry Cement. The latter product, produced by Portland cement manufacturers, is a mixture of Portland cement, finely ground high-calcium limestone (35-65% by weight), and a plasticizer. The generic products do not necessarily consist of Portland cement and limestone, but may include mixtures of Portland cement, hydrated lime and/or other plasticizers.

OUTLOOK

Shipments of cement in 1996 are expected to increase based on the trend toward lower interest rates early in the year and a moderate increase in construction activity. In addition, continued strength in exports to the United States is expected. If overall demand in North America continues to be firm, this will represent a continuation in the recovery of shipments from the recessionary levels that persisted during the 1990-92 period.

In 1995, housing starts dropped to about 112 000, according to the Canada Mortgage and Housing Corporation. By way of comparison, housing starts were 155 400 in 1993, 155 300 in 1994, and are expected to be about 120 000 in 1996. With real economic growth in both Canada and the United States forecast to continue, the outlook is positive in the office and industrial building sectors. Engineering-related construction will continue to benefit from the $6 billion cost-shared program for infrastructure renewal that has been extended from 1994-95 to 1998-99.

Energy management will continue to concentrate on gains in efficiency based on timely switching among the available choices of common fuels. However, most longer-term cost savings are expected to result from the partial substitution of fossil fuels by waste-derived fuels. For example, in the case of Refuse Derived Fuel (RDF), about 70% (by volume) of municipal solid waste from post-recycled curbside garbage could be extracted for use by the cement industry. This would reduce by about two thirds the volume of material for disposal as landfill. Under certain circumstances using RDF, reductions in requirements for traditional fuels have been predicted to be as high as 20-25%.

The use of supplementary cements incorporating pozzolans or slags, and classified accordingly as various types of blended cements, is expected to become more important in modern concrete practice.

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 February 1, 1996.

TARIFFS

Item No.	Description	Canada			United States
		MFN	GPT	USA	Canada
25.23	Portland cement, aluminous cement, slag cement, supersulphate cement and similar hydraulic cements, whether or not coloured or in the form of clinker				
2523.10	Cement clinker	Free	Free	Free	Free
	Portland cement:				
2523.21	White cement, whether or not artificially coloured	70.71¢/t	Free	Free	Free
2523.29	Other	Free	Free	Free	Free
2523.30	Aluminous cement	Free	Free	Free	Free
2523.90	Other hydraulic cements	Free	Free	Free	Free
68.10	Articles of cement, of concrete or of artificial stone, whether or not reinforced				
	Tiles, flagstones, bricks and similar articles:				
6810.11	Building blocks and bricks	4.7%	Free	Free	Free
6810.19	Other	7.5%	Free	Free	Free
6810.20	Pipes	9.1%	6.5%	Free	Free
6810.91	Prefabricated structural components for building or civil engineering	6.3-7.5%	Free-4.5%	Free	Free
6810.99	Other	7.5%	Free	Free	Free

Sources: Customs Tariff, effective January 1996, Revenue Canada; Harmonized Tariff Schedule of the United States, 1996.

TABLE 1. CANADA, CEMENT PRODUCTION AND TRADE, 1993-95

Item No.		1993		1994		1995p	
		(tonnes)	($000)	(tonnes)	($000)	(tonnes)	($000)
PRODUCTION[1] (all forms)							
	Ontario	3 446 593	243 863	4 088 557	291 261	4 216 195	310 549
	Alberta	x	x	x	x	x	x
	Quebec	2 343 453	138 047	2 840 138	182 246	2 736 000	177 150
	British Columbia	1 522 436	139 102	1 653 748	159 027	1 705 375	169 558
	Nova Scotia	x	x	x	x	x	x
	Newfoundland	x	x	x	x	x	x
	Total	9 393 581	724 091	10 584 414	838 130	10 722 038	876 466
IMPORTS							
2523.10	Cement clinker						
	United States	3 709	481	855	136	29	3
	Total	3 709	481	855	136	29	3
2523.21	Portland cement, white, whether or not artificially coloured						
	United States	9 830	1 647	8 055	1 232	3 645	715
	Japan	472	90	522	90	505	23
	Denmark	–	–	9	2	46	9
	Italy	–	–	210	26	–	–
	Spain	–	–	177	32	–	–
	Other countries	–	–	24	5	2	–
	Total	10 302	1 737	8 997	1 387	4 198	747
2523.29	Portland cement, n.e.s.						
	United States	485 946	31 335	499 681	33 902	461 201	32 098
	France	145	17	279	33	349	42
	United Kingdom	–	–	863	26	128	15
	Germany	8	1	222	27	40	5
	Other countries	205	25	366	20	1 543	84
	Total	486 304	31 378	501 411	34 008	463 261	32 244
2523.30	Aluminous cement						
	United States	10 499	4 731	12 970	6 204	12 546	6 263
	United Kingdom	–	–	35	24	140	68
	South Africa	–	–	27	20	40	22
	France	20	4	–	–	–	–
	Total	10 519	4 735	13 032	6 248	12 726	6 353
2523.90	Hydraulic cement, n.e.s.						
	United States	27 882	3 984	22 037	3 387	115 641	11 592
	Belgium	300	29	286	33	4 920	1 358
	United Kingdom	1 414	154	1 306	124	7 656	445
	Japan	–	–	90	23	242	62
	Colombia	–	–	106	10	515	58
	France	228	58	137	11	45	11
	Other countries	236	10	136	34	1 064	84
	Total	30 060	4 235	24 098	3 622	130 083	13 610
6810.11	Building blocks and bricks of cement, concrete or artificial stone						
	United States	..	3 811	..	2 877	..	1 465
	Other countries	–	–	..	11	..	15
	Total	..	3 811	..	2 888	..	1 480
6810.19	Tiles, flagstones and similar articles of cement/concrete or artificial stone						
	United States	..	9 276	..	9 147	..	10 469
	Italy	..	1 190	..	582	..	529
	Mexico	..	426	..	489	..	207
	Spain	..	181	..	85	..	171
	France	–	–	..	1	..	94
	Other countries	..	177	..	74	..	104
	Total	..	11 250	..	10 378	..	11 574

TABLE 1 (cont'd)

Item No.		1993		1994		1995p	
		(tonnes)	($000)	(tonnes)	($000)	(tonnes)	($000)
IMPORTS (cont'd)							
6810.20	Pipes of cement or concrete						
	United States	..	21	..	17	..	1 284
	Total	..	21	..	17	..	1 284
6810.91	Prefabricated structural components of buildings, etc., of cement/concrete, etc.						
	United States	..	2 997	..	3 360	..	2 879
	United Kingdom	..	67	..	156	..	333
	Netherlands	..	4	..	4	..	26
	Portugal	–	–	–	–	..	21
	Germany	–	–	..	1	..	17
	Other countries	..	15	..	10	–	–
	Total	..	3 083	..	3 531	..	3 276
6810.99	Articles of cement, of concrete or of artificial stone, n.e.s.						
	United States	..	10 186	..	10 951	..	10 328
	Italy	..	124	..	119	..	350
	People's Republic of China	..	36	..	43	..	198
	United Kingdom	..	629	..	236	..	162
	Mexico	..	337	..	95	..	140
	Other countries	..	82	..	141	..	179
	Total	..	11 394	..	11 585	..	11 357
EXPORTS							
2523.10	Cement clinker						
	United States	882 935	36 686	959 053	45 728	1 329 489	62 580
	Switzerland	–	–	–	–	35	10
	St. Pierre and Miquelon	–	–	–	–	24	3
	Belgium	–	–	20	6	–	–
	Dominican Republic	–	–	21 951	637	–	–
	Total	882 935	36 686	981 024	46 371	1 329 548	62 593
2523.21	Portland cement, white, whether or not artificially coloured						
	United States	123 150	17 971	98 114	13 380	166 811	19 992
	Cuba	–	–	–	–	14	6
	St. Pierre and Miquelon	131	16	52	6	32	4
	Belgium	–	–	20	2	39	4
	France	958	29	–	–	–	–
	Other countries	–	–	35	50	–	–
	Total	124 239	18 016	98 221	13 438	166 896	20 006
2523.29	Portland cement, n.e.s.						
	United States	2 619 514	142 781	3 255 636	182 618	3 359 269	199 436
	St. Pierre and Miquelon	282	35	152	23	868	121
	United Arab Emirates	–	–	–	–	20	15
	Belgium	–	–	–	–	40	9
	France	327	42	–	–	30	4
	Spain	–	–	–	–	26	3
	Mexico	79 399	2 300	–	–	–	–
	Other countries	11	4	–	–	–	–
	Total	2 699 533	145 162	3 255 788	182 641	3 360 253	199 588
2523.30	Aluminous cement						
	Spain	–	–	–	–	17	16
	United States	90	4	–	–	7	6
	Total	90	4	–	–	24	22
2523.90	Hydraulic cement, n.e.s.						
	United States	7 110	1 339	674	413	2 357	852
	Hong Kong	–	–	21	11	96	97
	Czech Republic	–	–	14	13	59	83
	Taiwan	34	33	169	47	66	61
	Other countries	544	158	242	105	396	261
	Total	7 688	1 530	1 120	589	2 974	1 354

TABLE 1 (cont'd)

Item No.		1993		1994		1995p	
		(tonnes)	($000)	(tonnes)	($000)	(tonnes)	($000)
EXPORTS (cont'd)							
6810.11	Building blocks and bricks of cement, concrete or artificial stone						
	United States	..	7 011	..	9 241	..	11 035
	United Arab Emirates	–	–	–	–	..	402
	Japan	–	–	..	340	..	273
	Other countries	..	41	..	4	..	44
	Total	..	7 052	..	9 585	..	11 754
6810.19	Tiles, flagstones and similar articles of cement/concrete or artificial stone						
	United States	..	4 823	..	8 783	..	14 119
	Japan	..	...	..	4	..	133
	Taiwan	–	–	..	3	..	62
	Costa Rica	–	–	..	13	..	38
	Chile	–	–	–	–	..	34
	Other countries	..	36	..	182	..	62
	Total	..	4 859	..	8 985	..	14 448
6810.20	Pipes of cement or concrete						
	United States	..	250	..	1 332	..	505
	St. Pierre and Miquelon	–	–	–	–	..	16
	Total	..	250	..	1 332	..	521
6810.91	Prefabricated structural components of buildings, etc., of cement/concrete, etc.						
	United States	..	31 673	..	46 299	..	73 926
	Malaysia	–	–	..	11	..	322
	France	–	–	–	–	..	55
	Russia	–	–	–	–	..	44
	United Kingdom	..	37	..	2 157	..	12
	Hungary	..	155	–	–	–	–
	People's Republic of China	..	443	..	314	–	–
	Japan	..	107	..	60	–	–
	Taiwan	..	38	..	306	–	–
	Other countries	..	18	..	416	..	39
	Total	..	32 471	..	49 563	..	74 398
6810.99	Articles of cement, of concrete or of artificial stone, n.e.s.						
	United States	..	12 766	..	15 820	..	16 212
	Japan	..	1	–	–	..	54
	Czech Republic	–	–	..	12	..	25
	Singapore	–	–	–	–	..	10
	Bermuda	–	–	–	–	..	6
	United Kingdom	..	77	–	–	–	–
	Estonia	..	26	..	20	–	–
	Taiwan	..	37	–	–	–	–
	Saint Lucia	–	–	..	5	–	–
	Total	..	12 907	..	15 857	..	16 307

Sources: Natural Resources Canada; Statistics Canada.
– Nil; **. .** Not available; **. . .** Amount too small to be expressed; n.e.s. Not elsewhere specified; **p** Preliminary; **r** Revised; x Confidential.
1 Producers' shipments plus quantities used by producers.
Note: Numbers may not add to totals due to rounding.

TABLE 2. CEMENT PLANTS, APPROXIMATE ANNUAL GRINDING CAPACITY, END OF 1994

Company	Plant	Wet (W) Dry (D) Preheater (x) Precalciner (c)	Fuel (Coal, Oil, Gas, Waste)	No. of Kilns	Grinding Capacity	Clinker Capacity
					(000 t/y)	
ATLANTIC REGION						
Lafarge Canada Inc.	Brookfield, N.S.	D	C,O,Wa	2	600	534[a]
North Star Cement Limited	Corner Brook, Nfld.	Dx	O,Wa	1	245	153
Subtotal, Atlantic region				3	845	687
QUEBEC						
Lafarge Canada Inc.	Montréal East		–		328	–
Lafarge Canada Inc.	St. Constant	D	C,O,G,Wa	2	1 000	990
Ciment Québec Inc.	St. Basile	W,Dc	O,G,C	3	940	1 077[b]
St. Lawrence Cement Inc.	Beauport	W	C, O,Wa	2	700	608
(Independent Cement Inc.)	Joliette	D	C,Wa	4	1 200	992[a]
Subtotal, Quebec region				11	4 168	3 667
ONTARIO						
Lafarge Canada Inc.	Woodstock	W	C,G	2	610	538[a]
	Bath	Dx	C,G	1	1 000	1 054
Federal White Cement Ltd.	Woodstock	D	C,O,G	1	180	179
ESSROC Canada Inc.	Picton	D,Dx	C,G	2	854	1 123
St. Lawrence Cement Inc.	Mississauga	Dc	C,O,Wa	3	1 752	1 878[b]
St. Marys Cement Company	Bowmanville	Dc	C	1	1 300	1 550
	St. Marys	Dx	C,Wa	1	800	651
Subtotal, Ontario region				11	6 496	6 973
PRAIRIES REGION						
Lafarge Canada Inc.	Winnipeg, Man.		–	–	474	–
	Exshaw, Alta.	D,Dc	G	2	900	1 029
Inland Cement Limited	Winnipeg, Man.	W	–	1	431	inactive
(Cimenteries CBR/Heidelberger)	Regina, Sask.	D	–	1	400	inactive
	Edmonton, Alta.	Dc	G	1	1 512	725
Subtotal, Prairies region				5	3 717	1 754
BRITISH COLUMBIA						
Lafarge Canada Inc.	Kamloops	D	C,G	1	300	194
	Richmond	W	C,G,Wa	2	515	474
Tilbury Cement Limited (Cimenteries CBR/Heidelberger)	Delta	Dx	C,G	1	980	1 040
Subtotal, B.C. region				4	1 795	1 708
Total Canada (9 companies)				34	17 021	14 789

Source: Market and Economic Research Department, Portland Cement Association.
– Nil.
[a] One kiln inactive. [b] Two kilns inactive.
Note: Total active kiln capacity is approximately 13.4 Mt/y.

TABLE 3. CANADA, CEMENT PLANTS, KILNS AND CAPACITY UTILIZATION, 1980-95

	Clinker-Producing Plants	Kilns	Approximate Cement Grinding Capacity[1]	Portland and Masonry Cement Production[2]	Clinker Exports	Approximate Total Production[3]	Capacity Utilization
			(t/y)	(t)	(t)	(t)	(%)
1980	23	47	16 363 000	10 274 000	726 087	11 000 087	67
1981	23	48	16 771 000	10 145 000	524 006	10 669 006	64
1982	23	48	16 771 000	8 418 000	290 329	8 708 329	50
1983	23	49	17 900 000	7 870 878	404 793	8 275 671	46
1984	23	49	17 900 000	9 387 466	440 297	9 827 763	55
1985	23	49	17 900 000	10 192 442	676 596	10 869 038	61
1986	23	49	17 900 000	10 611 223	324 000	10 935 223	61
1987	20	40	16 600 000	12 603 164	767 338	13 370 502	81
1988	20	40	15 506 000	12 349 873	331 796	12 681 669	82
1989	20	38	15 546 000	12 590 637	178 491	12 769 128	82
1990	20	38	16 439 000	11 745 152	460 075	12 205 227	74
1991	20	34	16 262 000	9 372 219	544 870	9 917 089	61
1992	18	34[a]	16 800 000	8 593 399	988 348	9 581 747	57
1993	18	34[a]	16 800 000	9 393 581	882 935	10 276 516	61
1994	18	34[a]	17 000 000	10 584 414	981 024	11 565 438	68
1995[p]	18	34[a]	17 000 000	10 722 039	1 329 548	12 051 587	71

Sources: Statistics Canada; Portland Cement Association.
[p] Preliminary.
[a] Includes inactive kilns.
[1] Includes plants that grind only. [2] Producers' shipments and amounts used by producers. [3] Cement shipments plus clinker exports.

TABLE 4. CANADA, HOUSE CONSTRUCTION, BY PROVINCE, 1994 AND 1995

	Starts			Completions			Under Construction		
	1994	1995	% Diff.	1994	1995	% Diff.	1994	1995	% Diff.
Newfoundland	2 243	1 712		2 590	1 749		1 991	1 928	
Prince Edward Island	669	422		742	467		207	163	
Nova Scotia	4 748	4 168		4 920	4 170		2 038	1 980	
New Brunswick	3 203	2 300		3 696	2 465		1 202	1 003	
Subtotal, Atlantic provinces	10 863	8 602	–21	11 948	8 851	–26	5 438	5 074	–7
Quebec	34 154	21 885	–36	36 345	23 363	–36	7 730	5 986	–23
Ontario	46 645	35 818	–23	49 106	36 278	–26	22 444	21 947	–2
Manitoba	3 197	1 963		2 996	2 153		1 206	808	
Saskatchewan	2 098	1 702		1 851	1 711		836	818	
Alberta	17 692	13 906		18 671	13 373		6 703	7 156	
Subtotal, Prairie provinces	22 987	17 571	–34	23 518	17 237	–27	8 745	8 782	–
British Columbia	39 408	27 057	–31	41 168	33 772	–18	27 205	20 250	–26
Total Canada	154 057	110 933	–28	162 085	11 950	–26	71 562	62 039	–13

Source: Canada Mortgage and Housing Corporation.

TABLE 5. CANADA, VALUE OF CONSTRUCTION BY PROVINCE,[1] 1991-93

	1991[1]			1992[2]			1993[2]		
	Building Construction[2]	Engineering Construction[2]	Total	Building Construction[2]	Engineering Construction[2]	Total	Building Construction[2]	Engineering Construction[2]	Total
	($ millions)								
Newfoundland	906	871	1 777	699	876	1 575	696	1 308	2 004
Nova Scotia	1 544	955	2 499	1 160	744	1 904	1 255	647	1 902
New Brunswick	1 150	837	1 987	948	457	1 405	939	664	1 603
Prince Edward Island	257	99	356	194	88	282	211	65	276
Quebec	14 032	6 369	20 401	11 076	4 779	15 855	10 796	5 117	15 913
Ontario	24 980	8 978	33 958	20 244	7 032	27 276	17 634	5 953	23 587
Manitoba	1 500	1 226	2 725	1 103	885	1 988	1 174	735	1 909
Saskatchewan	1 269	2 254	3 523	949	1 376	2 325	961	1 481	2 442
Alberta	5 577	7 170	12 747	5 573	5 307	10 880	5 478	7 072	12 550
British Columbia, Yukon and Northwest Territories	9 684	4 497	14 182	10 014	2 913	12 927	10 094	3 262	13 356
Total Canada	60 901	33 254	94 155	51 960	24 457	76 417	49 238	26 304	75 542

Sources: Natural Resources Canada; Statistics Canada, Catalogue no. 64-201 (1991) and Catalogue no. 61-223 (1992 and 1993).
[1] Expenditures include total value of new and repair work purchased. [2] Expenditures include value of new as well as major renovation work purchased.
Note: Numbers may not add to totals due to rounding.

TABLE 6. CANADA, VALUE OF CONSTRUCTION BY TYPE, 1991-93

	1991[a]	1992[b]	1993[b]
	($ millions)		
BUILDING CONSTRUCTION			
Residential	34 768	33 676	32 577
Industrial	3 642	2 563	2 219
Commercial	13 436	9 331	8 479
Institutional	5 845	4 536	4 123
Other building	3 210	1 854	1 840
Subtotal	60 901	51 960	49 238
ENGINEERING CONSTRUCTION			
Marine	553	415	243
Transportation	6 334	5 113	5 340
Waterworks, sewage systems	2 660	903	793
Dams, irrigation	399	1 175	1 303
Electric power	6 859	5 944	5 347
Railway, telephones	3 135	1 561	1 587
Gas and oil facilities	9 629	7 291	9 503
Other engineering	3 686	2 055	2 188
Subtotal	33 254	24 457	26 304
Total construction	94 154	76 417	75 542

Sources: Natural Resources Canada; Statistics Canada, Catalogue no. 64-201 (1991) and Catalogue no. 61-223 (1992 and 1993).
[a] Expenditures include total value of new and repair work purchased.
[b] Expenditures include value of new as well as major renovation work purchased.
Note: Numbers may not add to totals due to rounding.

TABLE 7. WORLD PRODUCTION OF CEMENT, 1994 AND 1995

	1994	1995[e]
	(000 tonnes)	
People's Republic of China	400 000	410 000
Japan	91 500	92 000
United States	77 900	77 000
Russia, Republic of	50 000	55 000
India	54 000	55 000
Korea, Republic of	52 100	53 000
Italy	40 000	45 000
Germany	40 400	40 400
Brazil	26 000	28 000
Spain	26 000	30 000
France	20 200	24 000
Canada	10 600	10 700
Other	480 400	466 300
Total world	1 369 100	1 386 400

Sources: Natural Resources Canada; U.S. Bureau of Mines' Mineral Commodity Summaries, January 1996.
[e] Estimated.