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2008 Commercial & Institutional Consumption of Energy Survey

Summary Report

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Natural Resources Canada's Office of Energy Efficiency
Leading Canadians to Energy Efficiency at Home, at Work and on the Road



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■ FOREWORD

In 2009, Statistics Canada conducted a fifth Commercial and Institutional Consumption of Energy Survey (CICES) for the Office of Energy Efficiency (OEE) of Natural Resources Canada (NRCan). This report presents the results of this survey, which are based on data gathered for 2008. CICES delivers on OEE's mandate to strengthen and expand Canada's commitment to energy efficiency by improving our understanding of how and where energy is used, which in turn helps to identify energy efficiency opportunities and progress towards a more energy efficient economy.

The first survey in this series, entitled Consumption of Energy Survey, covered only universities, colleges and hospitals for 2003. The next survey, which collected data for 2004, covered nearly all segments of the Commercial and Institutional (C&I) sector. CICES 2005 and 2007 maintained the scope of CICES 2004, but added questions on the type of equipment used, the age of the building occupied by the establishment and the type of energy used for space heating, space cooling and water heating.

In the same vein, CICES 2008 was designed to collect data on the energy consumption of C&I sector establishments. The data collected is used to monitor energy consumption in the C&I sector and assist in the development and assessment of NRCan's energy consumption reduction programs designed to support institutions and businesses. An example of such a program is the ecoENERGY for Buildings initiative, which encourages the construction of more energy-efficient buildings and retrofit to improve the efficiency of existing buildings.

This report on CICES 2008 was prepared by François Le Morvan. The project manager was Glen Ewaschuk, while overall direction was provided by Andrew Kormylo, of the Demand Policy and Analysis Division of the OEE. An electronic version of the publication is available on the OEE Web site at oee.nrcan.gc.ca/statistics.

For more information on this publication or the OEE's services, please visit the Web site at oee.nrcan.gc.ca. You can also contact the OEE by e-mail at euc.cec@nrcan.gc.ca or by writing to

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■ OTHER OFFICE OF ENERGY EFFICIENCY SURVEYS AND PUBLICATIONS

Over the past few years, the OEE has implemented several initiatives to collect energy data and estimate energy consumption in the C&I sector.

- The **Commercial and Institutional Building Energy Use Survey (CIBEUS)** was the first survey of its kind in Canada. This survey gathered year 2000 data on energy consumption, energy intensity, and the physical and energy-efficient characteristics of C&I buildings located in Canada's major urban centres.
- As stated in the Foreword, the first **Consumption of Energy Survey (CES)** was based on year 2003 data. This survey focused exclusively on Canada's universities, colleges and hospitals. Unlike CIBEUS 2000, which only surveyed major urban centres, CES 2003 covered all ten Canadian provinces. Moreover, CES 2003 was based on the establishments as defined by the North American Industry Classification System (NAICS), while the CIBEUS 2000 defined its own building categories based on their usage and physical characteristics.
- For the 2004 survey, the scope of CES was increased to cover a much broader cross-section of the C&I sector. To reflect this change, the survey was renamed the **Commercial and Institutional Consumption of Energy Survey (CICES)**. The CICES survey was updated in 2005, 2007 and now 2008.
- Each year, the OEE publishes its **Energy Use Data Handbook**. This handbook provides, among other items, data on energy consumption by activity type for the C&I sector, and various indicators that impact energy use. This database draws from diverse sources of information, including the above mentioned surveys and the *Report on Energy Supply-Demand in Canada* (described below).

- **Energy Efficiency Trends in Canada** is a yearly publication that presents analysis based on data from the *Energy Use Data Handbook*. This report provides an overview of energy use and related greenhouse gas emissions in the C&I sector. In addition to providing detailed information about current energy intensity and energy efficiency, this report also analyses trends starting from 1990.
- Through various other programs, the OEE has also published sectoral studies based on comparative analyses. These studies have centred on, among other subjects, the hospitality sector, the retail sector and schools. Owners of commercial buildings can use these studies to compare their facility's energy consumption with that of similar facilities.

All of the above mentioned publications are available upon request from the OEE's Web site (oee.nrcan.gc.ca/statistics/publications).

The **Report on Energy Supply-Demand in Canada (RESD)**, a yearly publication from Statistics Canada, also contains energy data from the C&I sector. The RESD presents data on the production, sale, inter-provincial transfer, and consumption of energy by sector. The estimates in the present document vary from those published in the RESD, as the two initiatives define the C&I sector differently, with the RESD's definition being somewhat broader. Furthermore, there are several differences in methodology as the RESD estimates Canada's energy supply and demand figures using supply and distribution models based on data from several annual surveys on energy availability (energy sales and distribution information reported by suppliers), as well as from many other data sources.

NOTE TO READERS:

All these surveys, handbooks and studies are fundamentally different in that there are important conceptual and methodological differences between them. Caution must therefore be exercised when directly comparing data from these sources.

■ TABLE OF CONTENTS

FOREWORD	i
OTHER OFFICE OF ENERGY EFFICIENCY SURVEYS AND PUBLICATIONS	iii
HIGHLIGHTS	1
DATA QUALITY	1
1 Statistics on the Commercial & Institutional Sector in Canada	3
1.1 Number of establishments and floor area	4
1.2 Energy consumption	6
1.3 Energy intensity	6
2 Energy Consumption and Energy Intensity in the Regions	9
2.1 Number of establishments	9
2.2 Floor area	11
2.3 Energy consumption	13
2.4 Energy intensity	15
3 Energy Consumption by Energy Source	18
4 Floor Area	20
4.1 Key variables by floor area category	20
4.2 Key variables by floor area category and by activity grouping	21
4.3 Energy intensity by floor area category and by activity grouping	24
5 Building Age	27
6 Energy Sources Used for Space Heating, Space Cooling and Water Heating	30
6.1 Space heating.....	30
6.2 Space cooling	31
6.3 Water heating.....	32
7 Use of Auxiliary Equipment	33
APPENDIX A — CLASSIFICATION OF COMMERCIAL & INSTITUTIONAL ESTABLISHMENTS	35
APPENDIX B — METHODOLOGY	37
APPENDIX C — GLOSSARY	41
APPENDIX D — QUESTIONNAIRE	45
APPENDIX E — BACKGROUND DATA	52
APPENDIX F — SUMMARY OF 2007 COMMERCIAL & INSTITUTIONAL CONSUMPTION OF ENERGY SURVEY	53



HIGHLIGHTS

- CICES 2008 estimated that the Canadian C&I sector in 2008 comprised almost 470 thousand establishments occupying 705 million square meters of floor area.
- In 2008 CICES estimated the total energy consumption of C&I establishments at 866 million gigajoules (GJ). This is equivalent to the annual energy consumption of over 8 million Canadian households¹, or close to two thirds of the Canadian housing sector.²
- CICES found that the total energy intensity of establishments in the C&I sector was 1.23 GJ per square metre (m²) of floor area.
- Based on establishment activity groupings, Religious Organizations had the lowest energy intensity (0.72 GJ/m²), followed by Elementary and Secondary Schools for which the energy intensity was 0.86 GJ/m². Food Services and Drinking Places had the highest energy intensity (3.20 GJ/m²), followed by Hospitals (2.68 GJ/m²).
- A regional comparison revealed that Ontario and Quebec had the lowest intensity levels among the C&I establishments, with rates of 1.02 GJ/m² and 1.11 GJ/m² respectively. On the other hand, the Prairie region had the highest intensity rate at 1.69 GJ/m².
- The main primary energy source for space heating was natural gas (52% of establishments). Electricity was the primary energy source used for space cooling (86% of establishments) and water heating (60% of establishments).

DATA QUALITY

This report presents representative data estimates from CICES 2008 for C&I establishments in all Canadian provinces.

Certain rules established by Statistics Canada ensure the reliability of CICES 2008 data estimates for purposes of publication. The letters used in the tables of this report indicate the quality of each data estimate based on the degree of sampling error, as represented by the coefficient of variation.

The letter coding is as follows:

- A** — Very good
- B** — Acceptable
- C** — Use with caution
- F** — Too unreliable to be published or suppressed for reasons of confidentiality

Further detail on how the coefficient of variation is used to determine data quality is given in Appendix B, which describes the methodology used to conduct this survey.

¹ Natural Resources Canada, 2007 Survey of Household Energy Use, Section 11 – Energy consumption and intensity, Table 11.2 – Total energy intensity, p.162. http://oee.nrcan.gc.ca/corporate/statistics/neud/dpa/data_e/sheu07/sheu_047_1.cfm?attr=0

² Calculated with the data from 2007 Survey of Household Energy Use, Section 1 – Characteristics of households, Table 1.1 – General characteristics, p.2. http://oee.nrcan.gc.ca/corporate/statistics/neud/dpa/data_e/sheu07/sheu_001_1.cfm?attr=0

LIMITS ON THE ANALYSIS OF THESE RESULTS

Survey versus census results

It is important to note that CICES is a survey, not a census, of C&I sector establishments. Despite the best efforts of Statistics Canada to maintain a high level of quality for each of the survey's various phases, the data estimates produced are inevitably subject to variance in the level of confidence, as is the case with any survey.

The data presented in this report are estimates. The real values differ from the estimates by less than two times the co-efficient of variation 19 times out of 20. The methodology used to calculate estimates, as well as to collect data, is summarized in Appendix B.

1 Statistics on the Commercial & Institutional Sector in Canada

For the purposes of this survey, the C&I sector has been defined as a set of the North American Industry Classification System (NAICS) codes³. In this report, *Activity grouping* will refer to establishments within a group of related sector, subsector or industry groupings based on the NAICS.⁴ Table 1 shows the main survey results for CICES 2008 by these C&I activity groupings.

Activity Grouping	Number of Establishments		Energy Consumption (GJ) ⁵		Floor Area (m ²)		Average Floor Area per Establishment (m ²)		Energy Intensity ¹ (GJ/m ²)	
Wholesale and Warehousing	45 694	A	81 307 418	A	92 866 888	A	2 032	A	0.88	A
Retail Trade	101 147	A	105 318 105	A	96 774 018	A	957	A	1.09	A
• Non-food retail	82 462	A	73 656 068	A	83 507 346	A	1 013	A	0.88	A
• Food retail	18 685	A	31 662 037	A	13 266 672	A	710	A	2.39	A
Information and Cultural	6 875	A	15 486 497	C	11 358 699	B	1 652	B	1.36	A
Financial, Real Estate and Other Professional Services	77 859	A	88 321 631	C		F		F	0.92	A
Public Administration	7 088	A	74 470 570	B	40 225 724	C	5 675	C	1.85	A
Education	21 498	A	137 559 524	A	119 302 877	A	5 550	A	1.15	A
• Elementary and secondary schools	15 281	A	58 685 369	A	68 152 178	A	4 460	A	0.86	A
• Community colleges and CEGEPs	1 317	A	21 672 645	C	16 406 175	C	12 454	C	1.32	A
• Universities	254	A	54 394 657	A	32 054 593	B	126 264	B	1.70	A
• Business Schools and Others	4 646	A	2 806 853	C	2 689 930	B	579	B	1.04	A
Health Care	52 090	A	127 440 252	A	72 136 971	A	1 385	A	1.77	A
• Ambulatory health care services	36 070	A		F		F		F	1.80	C
• Hospitals	683	A	46 621 841	B	17 369 230	A	25 438	A	2.68	A
• Nursing and residential care facilities	5 206	A	38 235 613	A	25 340 897	A	4 868	A	1.51	A
• Social assistance	10 132	A	12 028 958	A	12 419 642	C	1 226	C	0.97	A
Accommodation Services	7 514	A	62 966 905	B	37 455 527	A	4 984	A	1.68	A
Food Services and Drinking Places	46 391	A	48 829 837	A	15 277 174	A	329	A	3.20	A
Religious Organizations	31 140	A	37 603 406	A	52 074 520	B	1 672	B	0.72	A
Other Services ²	71 821	A	86 743 018	A	71 582 365	A	997	A	1.21	A
Canadian C&I Sector	469 118	A	866 047 162	A	705 188 026	A	1 503	A	1.23	A

The letter to the right of each estimate indicates its quality, as follows: A – Very good, B – Acceptable, C – Use with caution, F – Too unreliable to be published or suppressed for reasons of confidentiality.

Due to rounding, numbers may not add up to the total shown, and some numbers may differ slightly from one table to the next.

¹ Energy intensity in the C&I sector is defined as total energy consumed (expressed in GJ) divided by total floor area (expressed in m²).

² The residual category "Other Services" includes the categories *Arts, Entertainment and Recreation* (NAICS 71) and *Other services except religious organizations* (NAICS 81, except 813110)

³ Refer to Appendix A.

⁴ Refer to Appendix B.

⁵ A gigajoule (GJ) is approximately equivalent to the energy consumed by using ten 60-watt light bulbs for eight hours a day for two months. It is also approximately equivalent to the energy consumed by the average Canadian personal vehicle in 5.5 days or the average digital television used in Canadian households in a year.

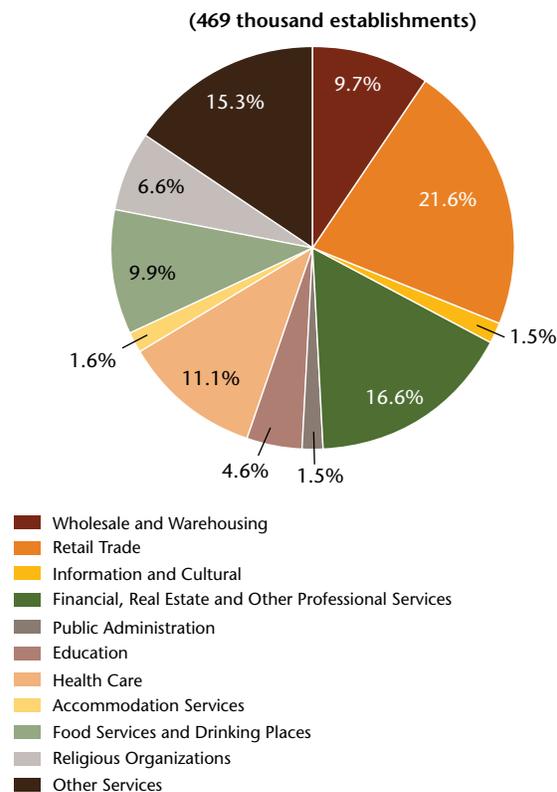
1.1 Number of establishments and floor area

1.1.1 Number of establishments

CICES 2008 estimated that the Canadian C&I sector was composed of almost 469 thousand establishments. Retail Trade accounted for more than one fifth of the total number of establishments, making it the largest activity grouping in the C&I sector (see Figure 1). This particular result is not surprising since the Retail Trade activity grouping is composed of a very diverse portfolio of establishments such as motor vehicle dealers, furniture stores, health care stores, grocery stores, and clothing stores among others⁶ that we find all across Canada, even in the smallest cities. The second and third most numerous activities in 2008 were Financial, Real Estate and Other Professional Services (16.6%) and Other Services (15.3%).

Accommodation Services, Public Administration, and Information and Cultural establishments represented the smallest shares of the C&I sector in 2008 (1.6%, 1.5% and 1.5% respectively).

FIGURE 1 Share of establishments in the C&I sector, by activity groupings, 2008



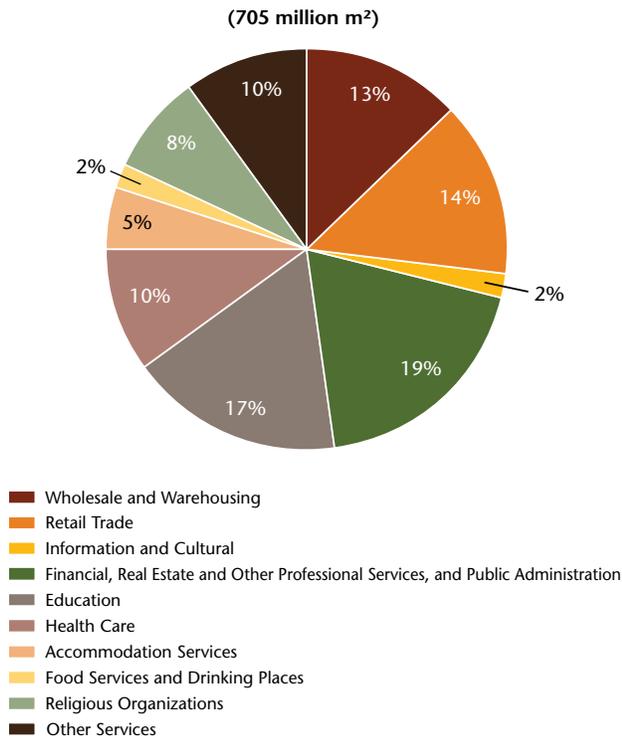
1.1.2 Floor area

In 2008, establishments in the C&I sector occupied over 705 million square meters (m²). The activity accounting for the largest proportion of the sector’s floor area (excluding the merged category of Financial, Real Estate and Other Professional Services, and Public Administration⁷) was Education. This was due in large part to Elementary and Secondary Schools, which were small in terms of average floor area per establishment, but numerous across Canada, and to a lesser extent to Universities, which were large in terms of average floor area per establishment, but fewer in number across Canada.

⁶ Refer to Appendix A.

⁷ Financial, Real Estate and Other Professional Services was merged with Public Administration to produce a reliable data estimate.

FIGURE 2 Share of floor area in the C&I sector, by activity groupings, 2008



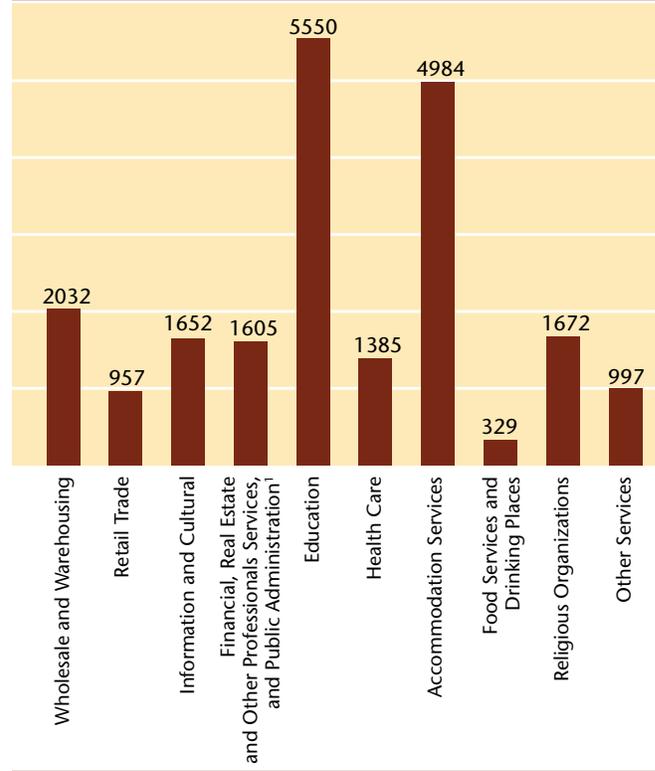
Other activities taking up large proportions of the floor area in the C&I sector were Retail Trade, and Wholesale and Warehousing. However, the Food Service and Drinking Places, and Information and Cultural activity groupings were the smallest activity groupings publishable in the C&I sector with each only accounting for 2% of the floor area across Canada.

1.1.3 Average floor area per establishment

CICES 2008 found that the average floor area of a C&I sector establishment was 1503 m². The activity grouping with the largest average floor area per establishment was Public Administration with 5675 m² (see Table 1). Education was second with 5550 m². The latter result should not come as a surprise since this category includes University Campuses, which are usually quite large (over 126 thousand m² per establishment in 2008). Although Hospitals were large on average (over 25 thousand m²), the Health Care activity grouping

had an average floor area per establishment of only 1385 m² due to the large number of small establishments in the Social Assistance category (over 10 thousand establishments with an average floor area of 1226 m²).

FIGURE 3 Average floor area (m²) by activity groupings, 2008



¹ Financial, Real Estate and Other Professional Services was merged with Public Administration to produce a reliable data estimate.

The Food Service and Drinking Places activity grouping had, on average, the smallest establishments, 329 m² (see Figure 3). Among other types of establishments, this activity grouping included limited-service eating places (food bar, counter, take-out restaurants), food service contractors (school and company cafeteria) and mobile food services. Finally, Retail Trade establishments were, on average, also very small (957 m²) because of their very nature as “the final step in the distribution of merchandise (...) in small quantities to the general public.”⁸

⁸ NAICS, 2007: Retail Trade definition, <http://stds.statcan.gc.ca/naics-scian/2007/cs-rc-eng.asp?criteria=44-45>.

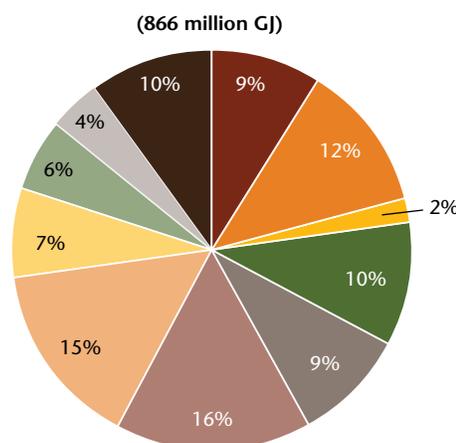
1.2 Energy consumption

CICES 2008 estimated that C&I establishments in Canada consumed over 866 million GJ of energy. This total amount is equivalent to the annual energy consumption of over 8 million Canadian households⁹, which is close to two thirds of the Canadian housing sector.¹⁰

In 2008, Education establishments consumed the most energy at 138 million GJ, or 16% of the total energy consumption of the sector (see Figure 4). In second and third place were Health Care (127 million GJ or 15%) and Retail Trade (105 million GJ or 12%) respectively.



FIGURE 4 Share of energy consumption in the C&I sector, by activity groupings, 2008



- Wholesale and Warehousing
- Retail Trade
- Information and Cultural
- Financial, Real Estate and Other Professional Services
- Public Administration
- Education
- Health Care
- Accommodation Services
- Food Services and Drinking Places
- Religious Organizations
- Other Services

1.3 Energy intensity

Energy intensity, defined as total energy consumed divided by total floor area in square metres, is influenced by factors such as the sector of activity (see Figure 5), geographical location (section 2.4), the size of buildings (section 4.3) and other physical characteristics, the age of the building (section 5), the type of equipment used, the occupants' habits and behaviour, the hours of operation, the energy-saving measures in place, and the type of energy used (section 3).

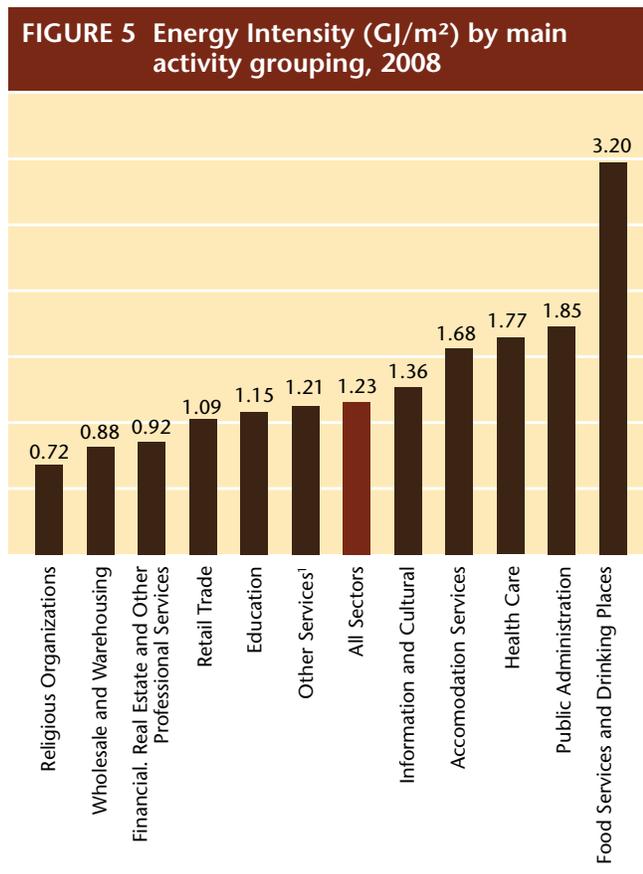
Although cumulative, each factor affecting an establishment's energy intensity acts independently and in its own complex way. For further details on the effects of individual factors on energy intensity,

⁹ Natural Resources Canada, 2007 *Survey of Household Energy Use*, Section 11 – Energy consumption and intensity, Table 11.2 – Total energy intensity, p.162. http://oee.nrcan.gc.ca/corporate/statistics/neud/dpa/data_e/sheu07/sheu_047_1.cfm?attr=0

¹⁰ Calculated with data from 2007 *Survey of Household Energy Use*, Section 1 – Characteristics of households, Table 1.1 – General characteristics, p.2. http://oee.nrcan.gc.ca/corporate/statistics/neud/dpa/data_e/sheu07/sheu_001_1.cfm?attr=0

please refer to the *Energy Efficiency Trends in Canada*, which describes how energy use is affected by the level of activity, weather, structure, level of service and energy efficiency.¹¹

Figure 5 presents the energy intensity for the main activity groupings as well as the entire C&I sector in Canada (1.23 GJ/m²).



¹ The residual category Other Services includes the categories Arts, Entertainment and Recreation (NAICS 71) and Other Services except Public Administration (NAICS 81).

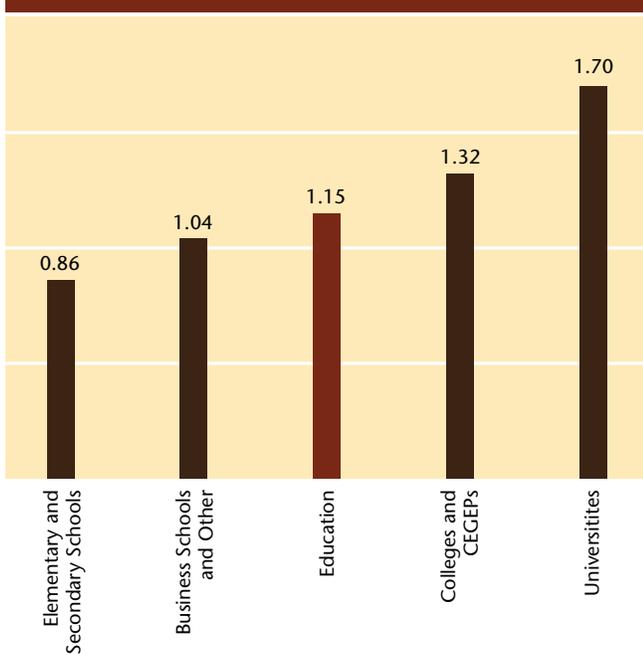
1.3.1 Low energy intensity activities

As illustrated by Figure 5, energy intensities ranged from 0.72 GJ/m² in Religious Organizations to 3.20 GJ/m² in Food Services and Drinking Places establishments. Along with Religious Organizations, Wholesale and Warehousing and Financial, Real Estate and Other Professional Services also had relatively low energy intensities at 0.88 and 0.92 respectively.

Figure 6 divides the Education category into its sub-activities to examine whether the energy intensity varies with the level of education provided by the establishment. As expected, Figure 6 shows that energy intensities within the Education activity varied widely. Colleges and CEGEPs, and Universities were much more energy intensive than Elementary and Secondary Schools. These differences can be explained by several factors including operating hours and student enrolment, which are greater for university campuses. In addition, the presence of certain energy intensive services such as cafeterias and sport facilities (like arenas or stadiums) are common in Universities and not in Elementary Schools. Furthermore, the use of more specialized equipment such as computers, computer servers, laboratory equipment etc. tends to be more intensive for Universities, and Colleges and CEGEPs.

In general, establishments with the lowest intensity ratios are those with limited operating hours (such as Religious Organizations), those that rarely open outside normal business hours, or those that operate on an irregular or seasonal basis (such as many Elementary and Secondary Schools). Moreover, these establishments tend not to operate energy-intensive equipment such as cooking appliances or specialized equipment.

¹¹ *Energy Efficiency Trends in Canada* is available on the OEE's Web site at <http://oee.nrcan.gc.ca/Publications/statistics/trends09/index.cfm?attr=0>

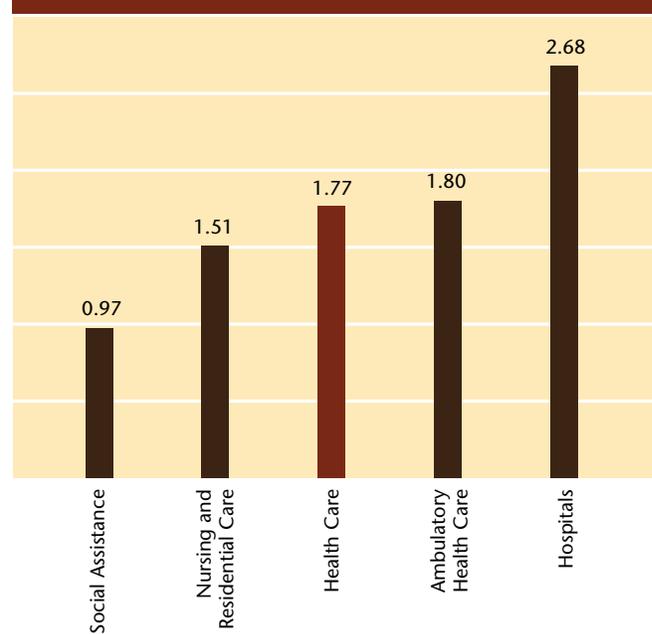
FIGURE 6 Energy intensity (GJ/m²) in the Education activity, 2008

1.3.2 High energy intensity activities

The Information and Cultural activity, which includes Broadcasting and Telecommunications industries, had a high energy intensity (1.36 GJ/m²). This could be, in part, due to the intensive utilization of electronics for broadcasting and telecommunication operations. Moreover, these industries tend to have longer hours of operation.

As expected, Health Care was one of the most energy intensive activities at 1.77 GJ/m² (see Figure 7). Like the Education activity grouping, the Health Care activity is composed of four broad categories of establishments that are expected to have various energy intensities. The Hospitals component with its very high energy intensity (2.68 GJ/m²) pulled the energy intensity of the entire Health Care activity upward, largely because of the high concentration of medical equipment, the extended business hours and the servicing of patients round the clock.

Finally, the Food Services and Drinking Places activity was the most energy intensive activity at 3.20 GJ/m² (see Figure 5). This result might be caused by the extensive use of high energy-using appliances such as freezers, refrigerators and cooking equipment in a relatively compact floor area.

FIGURE 7 Energy intensity (GJ/m²) in the Health Care activity grouping, 2008

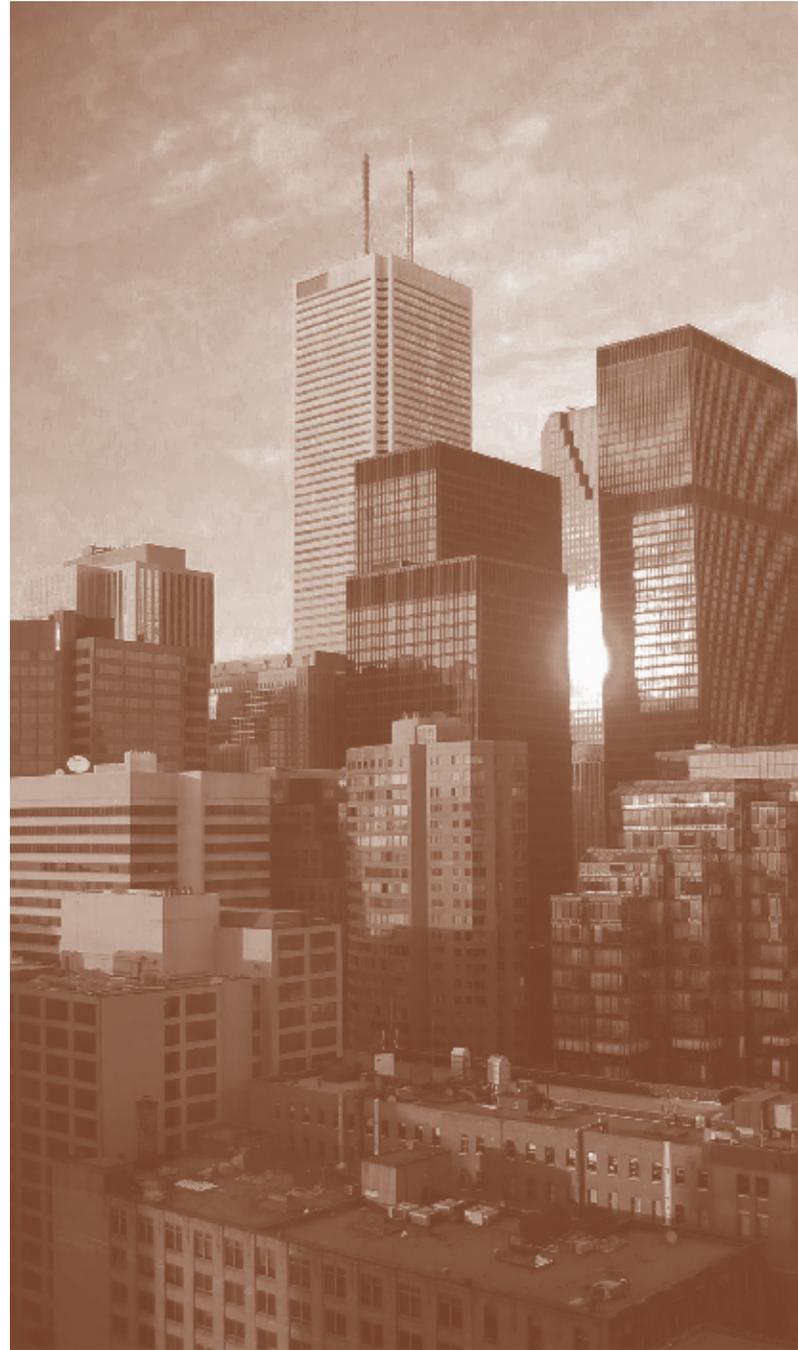
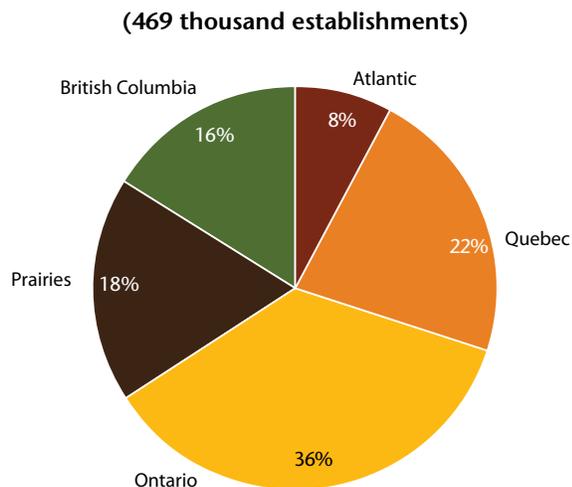
2 Energy Consumption and Energy Intensity in the Regions

This section examines the survey's overall regional results. Since the number of establishments, the energy consumption, the floor area and the energy intensity are all functions of the sector's structure, this report breaks down the regional results by activity grouping.

2.1 Number of establishments

According to the 2008 survey results, 36% of the C&I establishments were located in Ontario, 22% in Quebec, 18% in the Prairies, 16% in B.C. and 8% in Atlantic Canada (see Figure 8). These regional results are very similar to the proportions of the Canadian population living in each region (see appendix E).¹² The probable explanation for this similarity is that the number of C&I establishments in a region is generally related to the regional population.

FIGURE 8 Share of establishments in the C&I sector, by region, 2008



¹² Statistics Canada. Quarterly population estimates, national perspective – population, Catalogue No. 91-002-X.

Table 2. Number of establishments by activity grouping, by region, 2008

Activity Grouping	Number of Establishments											
	Canada		Atlantic		Quebec		Ontario		Prairies		British Columbia	
Wholesale and Warehousing	45 694	A	2 787	A	9 592	A	18 518	A	7 956	A	6 842	A
Retail Trade	101 147	A	8 114	A	25 344	A	33 657	A	18 531	A	15 502	A
• Non-food retail	82 462	A	6 499	A	20 838	A	27 074	A	15 103	A	12 947	A
• Food retail	18 685	A	1 615	A	4 505	A	6 583	A	3 428	A	2 554	A
Information and Cultural	6 875	A	482	A	1 588	A	2 246	A	1 096	A	1 462	A
Financial, Real Estate and Other Professional Services	77 859	A	4 840	A	17 804	A	31 968	A	11 349	A	11 899	A
Public Administration	7 088	A	1 287	A	1 736	A	1 151	A	2 349	A	565	A
Education	21 498	A	1 707	A	4 403	A	8 033	A	4 298	A	3 057	A
• Elementary and secondary schools	15 281	A	1 104	A	3 215	A	5 772	A	3 252	A	1 937	A
• Community colleges and CEGEPs	1 317	A	199	A	192	A	366	B	308	A	252	B
• Universities	254	A	34	A	36	A	94	A	47	A	43	A
• Business Schools and Others	4 646	A	369	A	960	A	1 802	A	690	A	824	A
Health Care	52 090	A	3 856	A	10 369	A	18 638	A	10 500	A	8 729	A
• Ambulatory health care services	36 070	A	2 324	B	5 808	A	13 928	A	7 157	B	6 853	A
• Hospitals	683	A	99	A	89	A	162	A	241	A	92	A
• Nursing and residential care facilities	5 206	A	556	A	1 630	A	1 514	A	924	A	582	A
• Social assistance	10 132	A	877	A	2 842	A	3 034	A	2 178	A	1 202	A
Accommodation Services	7 514	A	958	A	1 549	A	2 251	A	1 552	A	1 204	A
Food Services and Drinking Places	46 391	A	3 240	A	10 870	A	17 540	A	7 317	A	7 425	A
Religious Organizations	31 140	A	3 502	A	4 593	A	11 680	A	7 530	A	3 835	A
Other Services ¹	71 821	A	5 988	A	15 885	A	24 438	A	12 518	A	12 991	A
Total	469 118	A	36 760	A	103 732	A	170 120	A	84 996	A	73 510	A

The letter to the right of each estimate indicates its quality, as follows: A – Very good, B – Acceptable, C – Use with caution, F – Too unreliable to be published or suppressed for reasons of confidentiality.

Due to rounding, numbers may not add up to the total shown, and some numbers may differ slightly from one table to the next.

¹ The residual category "Other Services" includes the categories *Arts, Entertainment and Recreation* (NAICS 71) and *Other services except religious organizations* (NAICS 81, except 813110).

CICES 2008 found that the prevalence of certain activities was higher in certain regions than others. An example of this is Public Administration establishments, of which one-third were located in the Prairies (see Table 2). This finding is unexpected as only 18% of all C&I establishments in Canada were located in the region. The probable explanation for this is that this region represents

three separate provinces (Manitoba, Saskatchewan and Alberta), which each have their own provincial Public Administration establishments (i.e. provincial governments).

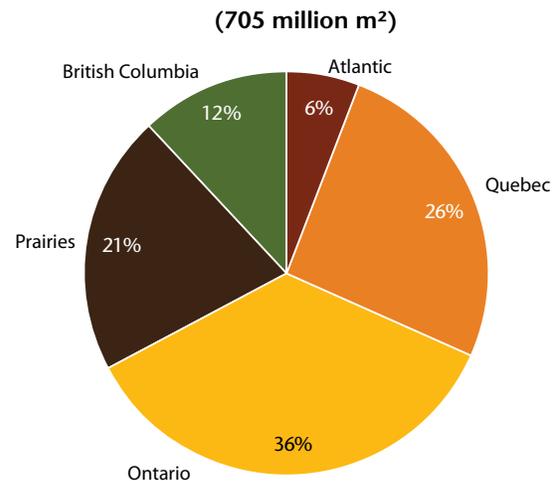
A similar situation is observed in the Atlantic region (which represents four provincial jurisdictions), which had only 8% of the C&I sector establishments in Canada, but 18% of the Public Administration establishments. It follows that this was not the case in the single-jurisdiction regions of Ontario, Quebec and British Columbia. For instance, though 36% of the country's C&I establishments were located in Ontario, the province had only 16% of all Public Administration establishments.

Although Health Care establishments were evenly distributed across the regions, that was not the case for the sub-activities associated with Health Care. For instance, Quebec, which had 20% of all Health Care establishments in Canada, possessed 31% of Nursing and Residential Care and 28% of the Social Assistance establishments. Also, more than one third (35%) of all Canadian hospitals were located in the Prairies region. Again, the probable explanation for this is that this region consists of three distinct and geographically large jurisdictions.

2.2 Floor area

In 2008, the Canadian C&I sector occupied more than 705 million m² of floor area. Figure 9 illustrates the regional distribution of floor area in 2008.

FIGURE 9 Share of floor area in the C&I sector, by region, 2008



*Percentages do not add up to 100 percent due to rounding



Table 3. Floor area of establishments by activity grouping, by region, 2008

Activity Grouping	Floor Area (m ²)											
	Canada		Atlantic		Quebec		Ontario		Prairies		British Columbia	
Wholesale and Warehousing	92 866 888	A	5 077 692	B	12 976 815	A	37 986 817	A	25 708 779	C	11 116 785	A
Retail Trade	96 774 018	A	8 041 264	B	18 071 638	A	34 037 465	C	18 469 360	A	18 154 291	B
• Non-food retail	83 507 346	A	6 841 028	C	14 518 265	A		F	15 788 873	A	16 205 237	C
• Food retail	13 266 672	A	1 200 236	A	3 553 373	A	3 883 522	A	2 680 488	A	1 949 053	C
Information and Cultural	11 358 699	B	1 084 371	B		F	3 248 015	B		F	681 830	B
Financial, Real Estate and Other Professional Services		F	1 664 026	A		F	15 412 250	B	7 703 213	C		F
Public Administration	40 225 724	C		F		F	21 999 738	C	8 546 367	B		F
Education	119 302 877	A	10 034 771	A	23 759 029	A	35 352 268	A	32 683 164	B	17 473 645	A
• Elementary and secondary schools	68 152 178	A	5 228 991	A	14 130 207	B	21 669 274	A	17 281 675	B	9 842 032	A
• Community colleges and CEGEPs	16 406 175	C	1 676 018	C	3 357 013	C		F		F		F
• Universities	32 054 593	B	2 921 120	A	5 604 391	B		F	8 853 118	B		F
• Business Schools and Others	2 689 930	B	208 643	B		F	879 765	A		F	413 172	C
Health Care	72 136 971	A	4 823 636	A	17 858 046	B	27 216 907	B		F		F
• Ambulatory health care services		F	464 296	B		F		F		F		F
• Hospitals	17 369 230	A	1 774 177	A	4 075 575	A	5 543 735	A		F	2 387 802	B
• Nursing and residential care facilities	25 340 897	A	1 669 368	B	8 957 578	C	7 717 613	A	5 916 637	C	1 079 701	B
• Social assistance	12 419 642	C	915 795	C	2 092 943	A		F	2 339 395	C	756 700	C
Accommodation Services	37 455 527	A	2 262 858	A		F	11 556 600	B		F	4 387 735	B
Food Services and Drinking Places	15 277 174	A	827 236	A	4 247 061	B	5 567 853	A	2 014 240	A	2 620 784	B
Religious Organizations	52 074 520	B	3 446 770	A	10 115 062	A		F	8 445 465	A	3 870 422	A
Other Services ¹	71 582 365	A	3 408 887	A	16 973 967	C	31 993 010	B	11 030 250	B	8 176 252	B
Total	705 188 026	A	42 740 303	A	180 826 204	B	250 567 723	A	147 710 570	A	83 343 225	A

The letter to the right of each estimate indicates its quality, as follows: A – Very good, B – Acceptable, C – Use with caution, F – Too unreliable to be published or suppressed for reasons of confidentiality.

Due to rounding, numbers may not add up to the total shown, and some numbers may differ slightly from one table to the next.

¹ The residual category "Other Services" includes the categories *Arts, Entertainment and Recreation* (NAICS 71) and *Other services except religious organizations* (NAICS 81, except 813110).

Ontario represented 55% of Canada's Public Administration's floor area, yet only 36% of the C&I sector floor area (see Table 3). This result was somewhat surprising as this province has only 16% of the Public Administration establishments. One

potential explanation could be that provincial public institutions in Ontario are centralized, therefore using fewer, but larger establishments. This region also includes the city of Ottawa, which contains very large federal government establishments.

Although the province of Quebec represented more than a quarter of all floor area in the C&I sector, only small proportions of the floor area of the Wholesale and Warehousing, and the Social Assistance activities were located in this province, 14% and 17% respectively. On the other hand, Nursing and Residential Care had a disproportionate share of its floor area in Quebec (35%), where 23% of the Canadian population lives.

2.3 Energy consumption

In 2008, the Canadian C&I sector consumed over 866 million gigajoules of energy. Figure 10 illustrates how energy consumption was distributed among provinces in 2008.

FIGURE 10 Share of energy consumption in the C&I sector, by region, 2008

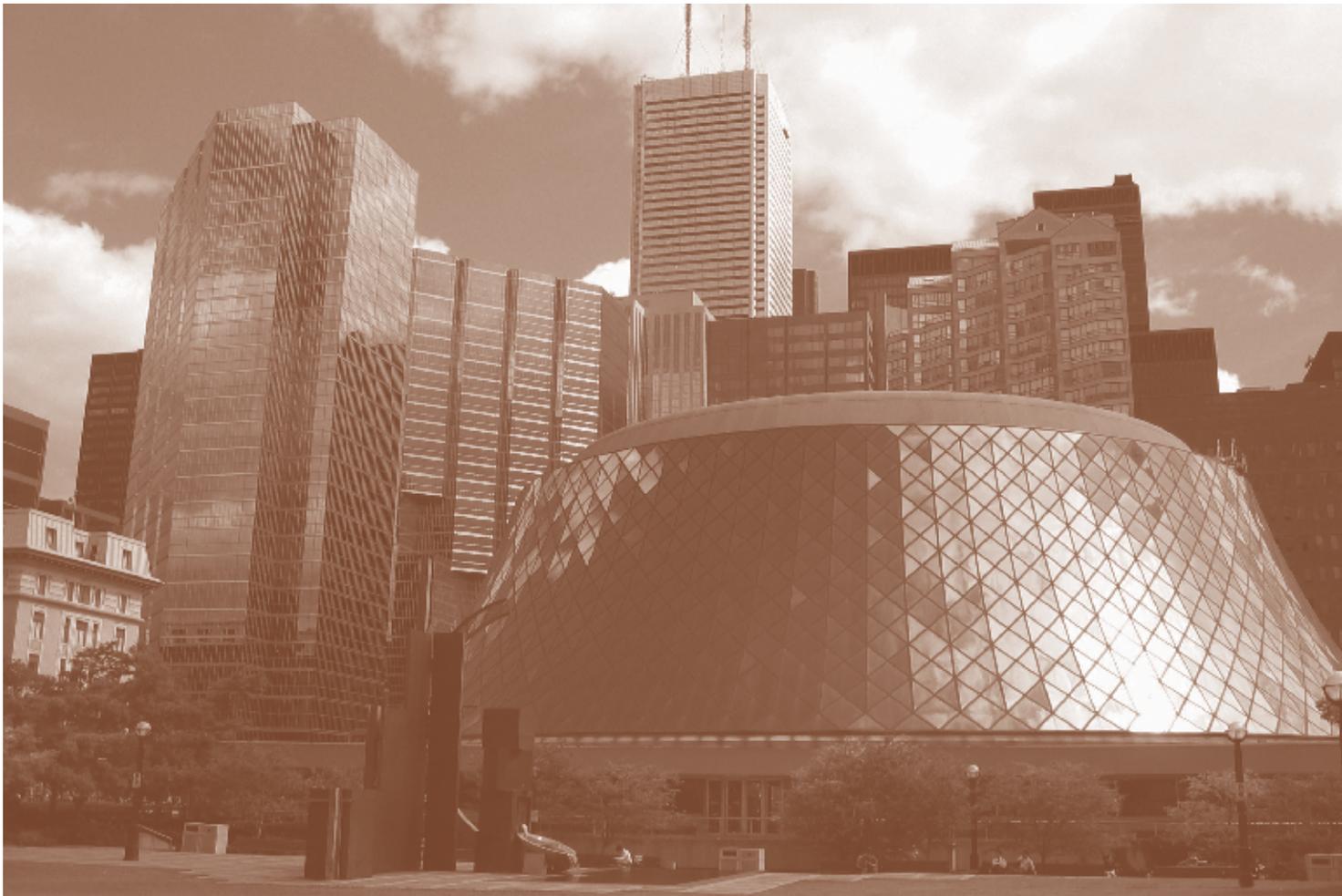
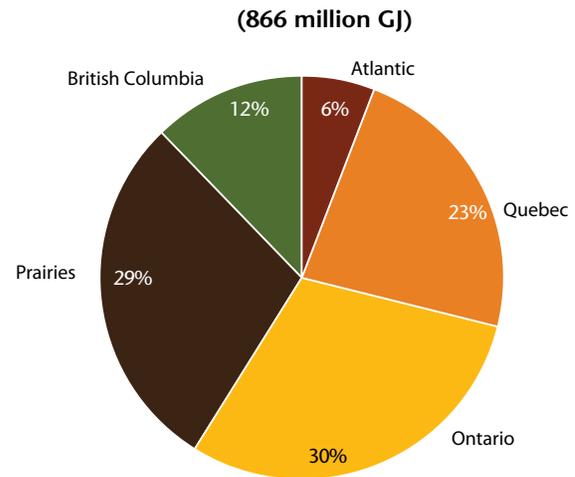


Table 4. Energy consumption of establishments by activity grouping, by region, 2008												
Activity Grouping	Energy Consumption (GJ)											
	Canada		Atlantic		Quebec		Ontario		Prairies		British Columbia	
Wholesale and Warehousing	81 307 418	A	7 069 275	B	8 867 677	A	33 191 760	A		F	10 233 821	B
Retail Trade	105 318 105	A	7 994 741	B	24 436 603	A	26 897 570	A	25 417 912	A	20 571 278	B
• Non-food retail	73 656 068	A	6 410 376	C	14 341 804	A	17 800 202	B	18 297 777	A	16 805 909	C
• Food retail	31 662 037	A	1 584 365	A	10 094 798	B	9 097 368	A	7 120 135	A	3 765 370	A
Information and Cultural	15 486 497	C		F		F	2 349 007	A		F	670 772	B
Financial, Real Estate and Other Professional Services	88 321 631	C	1 696 556	C		F	14 149 520	B		F		F
Public Administration	74 470 570	B		F		F	29 250 543	C	30 289 727	C		F
Education	137 559 524	A	11 194 379	A	20 962 913	A	32 239 512	A	52 005 791	B	21 156 929	B
• Elementary and secondary schools	58 685 369	A	3 501 832	B	9 831 303	B	16 345 855	A	19 334 471	C	9 671 908	B
• Community colleges and CEGEPs	21 672 645	C		F	3 156 833	C		F		F		F
• Universities	54 394 657	A	5 585 520	B	7 220 205	B		F	20 863 847	C		F
• Business Schools and Others	2 806 853	C	239 839	B		F	768 967	B		F	254 929	C
Health Care	127 440 252	A	7 821 027	A	33 452 364	B	39 844 066	A		F		F
• Ambulatory health care services		F	555 019	C		F		F		F		F
• Hospitals	46 621 841	B	4 702 764	A	7 718 775	A	14 157 781	A		F	4 474 961	B
• Nursing and residential care facilities	38 235 613	A	1 933 236	B	16 381 772	C	11 019 078	A	7 736 196	B	1 165 332	B
• Social assistance	12 028 958	A	630 008	C	2 258 661	B	5 078 925	C	3 553 162	C	508 201	C
Accommodation Services	62 966 905	A	2 039 993	A		F	12 365 603	B		F	6 792 901	A
Food Services and Drinking Places	48 829 837	A	2 439 926	A	11 577 600	A	16 170 737	A	9 138 978	B	9 502 596	B
Religious Organizations	37 603 406	A	2 395 570	A	7 433 048	A	19 114 607	A	6 168 303	A	2 491 878	A
Other Services¹	86 743 018	A	3 423 988	B	24 115 785	C	31 109 517	B	18 061 879	B	10 031 849	C
Total	866 047 162	A	52 968 665	A	201 253 253	A	256 682 441	A	249 509 033	A	105 633 770	A

The letter to the right of each estimate indicates its quality, as follows: A – Very good, B – Acceptable, C – Use with caution, F – Too unreliable to be published or suppressed for reasons of confidentiality.

Due to rounding, numbers may not add up to the total shown, and some numbers may differ slightly from one table to the next.

¹ The residual category "Other Services" includes the categories *Arts, Entertainment and Recreation* (NAICS 71) and *Other services except religious organizations* (NAICS 81, except 813110).

The Nursing and Residential Care establishments in Quebec consumed 43% of the activity grouping's energy for all of Canada (see Table 4). This high level of consumption was mainly caused by the high proportion of Nursing and Residential Care establishments (31%) and their associated floor area (35%) located in the province compared to the rest of the country.

In 2008, Education establishments located in the Prairies used 38% of the energy consumed by this activity grouping in Canada. This is despite the fact that the region only had 27% of this activity's floor area and 20% of its establishments.

Another activity grouping that consumed a significant proportion of its energy in the Prairies was Public Administration. This result can be explained by the fact that a large portion of Public Administration establishments were located in the region (see Table 2).

2.4 Energy intensity

Figure 11 illustrates the energy intensity in Canada and the regions for 2008. The energy intensity in the C&I sector was 1.23 GJ/m² in 2008. The lowest energy intensity was in Ontario (1.02 GJ/m²). As Table 5 illustrates, this seems to be the result of lower energy intensities across all activities rather than by one or two specific activities.

There are numerous and often complex factors which can influence energy intensities among regions. The interplay between these factors has a significant impact on the energy intensities at the regional level. Regional climatic differences and primary energy sources are two of the key factors affecting energy intensity.

FIGURE 11 Energy intensity (GJ/m²) by region, 2008

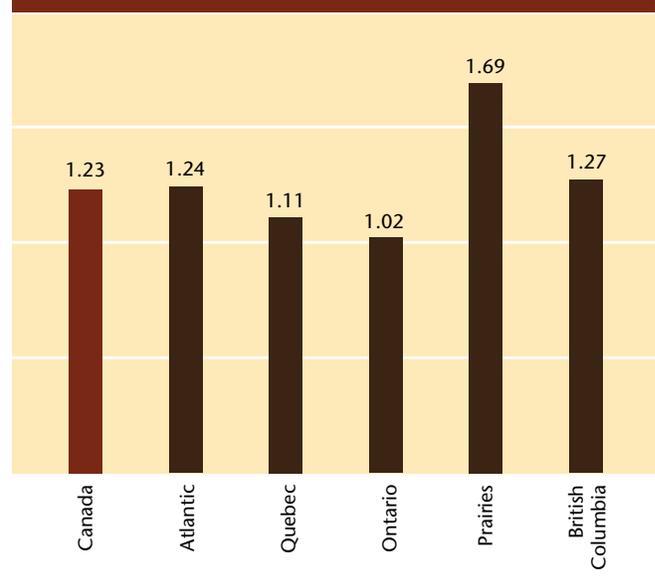


Table 5. Energy intensity of establishments by activity grouping, by region, 2008

Activity Grouping	Energy Intensity (GJ/m ²)											
	Canada		Atlantic		Quebec		Ontario		Prairies		British Columbia	
Wholesale and Warehousing	0.88	A	1.39	B	0.68	A	0.87	A	0.85	C	0.92	A
Retail Trade	1.09	A	0.99	A	1.35	A	0.79	C	1.38	A	1.13	A
• Non-food retail	0.88	A	0.94	A	0.99	A	0.59	C	1.16	A	1.04	B
• Food retail	2.39	A	1.32	A	2.84	A	2.34	A	2.66	A	1.93	C
Information and Cultural	1.36	A	2.34	C	1.30	A	0.72	A	1.77	A	0.98	A
Financial, Real Estate and Other Professional Services	0.92	A	1.02	B	0.84	A	0.92	A	1.65	A	0.79	C
Public Administration	1.85	A		F		F	1.33	A	3.54	A	1.74	A
Education	1.15	A	1.12	A	0.88	A	0.91	A	1.59	A	1.21	A
• Elementary and secondary schools	0.86	A	0.67	A	0.70	A	0.75	A	1.12	A	0.98	A
• Community colleges and CEGEPs	1.32	A	1.11	A	0.94	A	0.95	A	1.83	A	1.14	A
• Universities	1.70	A	1.91	A	1.29	A	1.24	B	2.36	A	1.83	A
• Business Schools and Others	1.04	A	1.15	B	1.13	B	0.87	A	1.51	B	0.62	B
Health Care	1.77	A	1.62	A	1.87	B	1.46	A	2.12	B		F
• Ambulatory health care services	1.80	C	1.20	A		F	1.25	B		F		F
• Hospitals	2.68	A	2.65	A	1.89	A	2.55	A	4.34	B	1.87	A
• Nursing and residential care facilities	1.51	A	1.16	A	1.83	A	1.43	A	1.31	B	1.08	A
• Social assistance	0.97	A	0.69	A	1.08	A	0.80	B	1.52	A	0.67	A
Accommodation Services	1.68	A	0.90	A	1.17	B	1.07	A	2.44	A	1.55	A
Food Services and Drinking Places	3.20	A	2.95	A	2.73	A	2.90	A	4.54	A	3.63	A
Religious Organizations	0.72	A	0.70	A	0.73	A	0.73	C	0.73	A	0.64	A
Other Services ¹	1.21	A	1.00	A	1.42	B	0.97	B	1.64	A	1.23	C
Canadian C&I Sector	1.23	A	1.24	A	1.11	A	1.02	A	1.69	A	1.27	A

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¹ The residual category "Other Services" includes the categories *Arts, Entertainment and Recreation* (NAICS 71) and *Other services except religious organizations* (NAICS 81, except 813110).

An analysis of the energy intensity for each activity grouping by region highlights certain regional differences (see Table 5).

The two highest energy intensities recorded in CICES 2008 were in the Food Services and Drinking Places, and Hospitals, both in the Prairies, at levels of 4.54 GJ/m² and 4.34 GJ/m², respectively. Indeed, the Prairies had the highest observed energy

intensities in almost every activity grouping. This is likely due to a combination of a relatively heavier reliance on fossil fuels (discussed in Section 3 on page 18) and a colder climate¹³ in this region compared with the other regions during 2008.

¹³ Natural Resources Canada, Office of Energy Efficiency, Energy End-Use Model database.

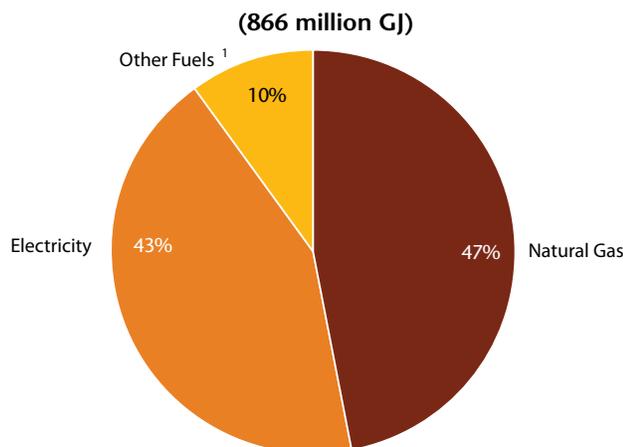


3 Energy Consumption by Energy Source

CICES 2008 gathered data on the energy consumption of C&I establishments by the specific energy sources consumed.

In 2008, natural gas accounted for 47% of the sector's energy use, while the electricity share was 43% (see Figure 12). The remaining 10% of the sector's energy use was distributed between steam, propane, diesel, heavy fuel oil, light fuel oil, and other fuels.

FIGURE 12 Share of energy consumption in the C&I sector, by energy source, 2008



¹ Other fuels category includes: steam, light fuel oil and middle distillates, propane, heavy fuel oil, diesel, wood and wood by-products, and other fuels.

Electricity is the primary energy source providing end-use energy services such as lighting, space cooling, auxiliary motors and equipment. However, combustible fuels such as natural gas and other fuels are, to a large extent, used to provide other end-use energy services such as space and water heating. It should be noted that unlike electricity, the use of combustible fuel will result in combustion losses at the building site, which will vary depending on the fuel and technology used. Therefore, the energy intensity of establishments using combustible fuels is inflated by these combustion losses. On the other hand, the energy

intensity of establishments using primarily electricity for space and water heating is diminished by the lack of these combustion losses.

From a regional standpoint (see Table 6), electricity represented a significant portion of total energy consumption in Eastern Canada, accounting for 56% of total energy consumption in Quebec and 45% in Atlantic Canada. One reason for the result in Quebec might be the relatively low electricity rates in the province.¹⁴ Natural gas was the dominant primary energy source in the Prairies and British Columbia, accounting for 56% of energy use.

The region that consumed the largest amount of energy in 2008 was Ontario. CICES 2008 shows that, due to its relatively heavy reliance on natural gas (49% of Ontario's energy consumption), the region was responsible for nearly one third (31%) of Canada's C&I sector's consumption of this fuel type. Electricity accounted for 44% of the Ontario's C&I energy consumption, while all other fuels combined made up the remaining 7% of the region's energy use.

Atlantic Canada consumed 40% of the light fuel oil and other middle distillates and almost half of the heavy fuel oil consumed in the C&I sector in Canada (47%). That being said, light fuel oil and other middle distillates represented only 15% of the region's energy consumption while heavy fuel oil only accounted for 7% of the region's energy consumption.

¹⁴ Natural Resources Canada, Office of Energy Efficiency, Energy End-Use Model database.

Table 6. Energy consumption of establishments by energy source, by region, 2008

Energy Consumption (GJ)												
Energy Source	Canada		Atlantic		Quebec		Ontario		Prairies		British Columbia	
Electricity	370 076 652	A	23 765 923	A	113 430 682	A	112 782 973	A	78 062 541	A	42 034 532	B
Natural Gas	402 915 670	A	6 615 675	B	70 844 992	B	126 357 084	A	140 116 364	A	58 981 554	A
Steam	15 318 657	B	1 595 838	B		F	4 567 011	C	4 445 582	C		F
Light Fuel Oil and Other Middle Distillates	19 312 409	C	7 702 547	A	4 733 352	C	1 928 019	C		F		F
Propane	14 257 233	B		F		F	2 749 640	C		F	1 383 299	B
Heavy Fuel Oil	8 363 501	A	3 946 709	B	787 825	C	3 245 409	C		F		F
Diesel		F		F		F	1 020 629	C		F		F
Other Fuels ¹		F	4 539 289	C		F		F		F		F
Total	866 047 162	A	52 968 665	A	201 253 253	A	256 682 441	A	249 509 033	A	105 633 770	A

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¹ Other fuels category includes: wood and wood by-products, waste oil, etc.



4 Floor Area

The data gathered by CICES 2008 allows the analysis of the relationship between floor area and key variables such as the number of establishments, energy consumption and energy intensity.

To analyse the C&I sector’s composition of establishments by floor area, establishments have been divided into five categories based on an establishment’s occupied floor area:

- Very small – less than 465 m² (approximately less than 5 000 ft.²)
- Small – 465 m² to 929 m² (approximately 5 000 ft.² to 10 000 ft.²)
- Medium – 930 m² to 4645 m² (approximately 10 000 ft.² to 50 000 ft.²)
- Large – 4646 m² to 9290 m² (approximately 50 000 ft.² to 100 000 ft.²)
- Very large – more than 9290 m² (approximately more than 100 000 ft.²)

4.1 Key variables by floor area category

Figure 13 illustrates the breakdown of the number of establishments, energy consumption and total floor area by floor area category.

FIGURE 13 Share of establishments, energy consumption and floor area in the C&I sector, by floor area categories, 2008

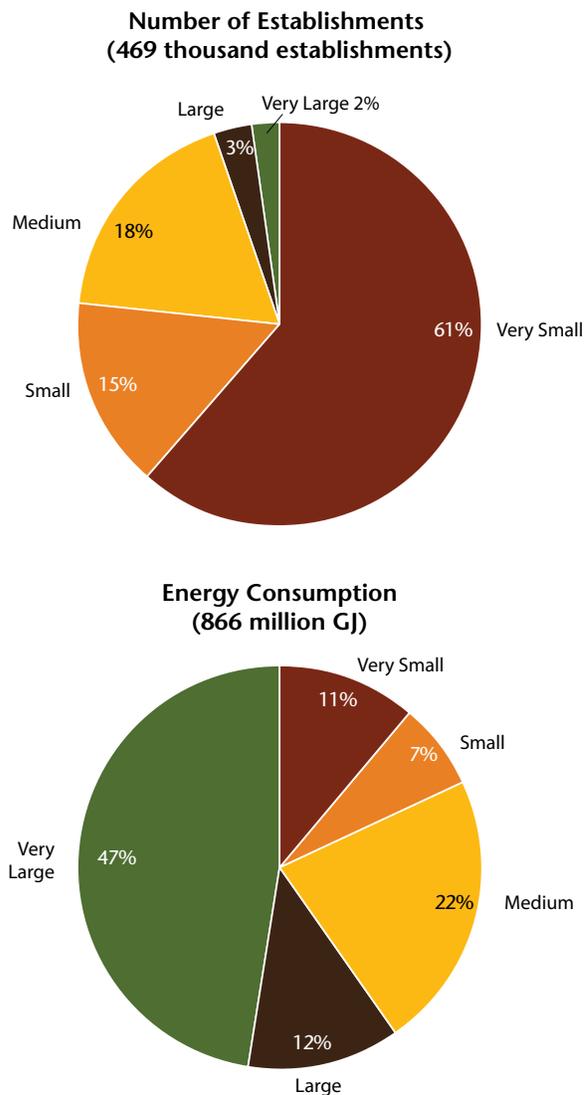
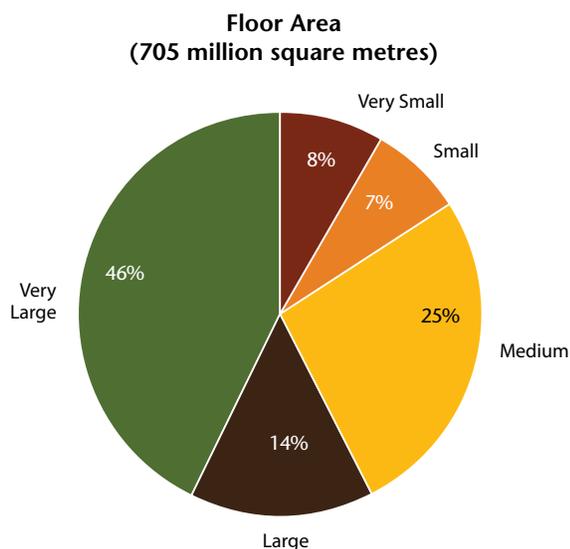


FIGURE 13 (continued)



Close to two-thirds of the establishments in the C&I sector were very small. Although this category had the largest number of establishments, it accounted for only 11% of energy consumption and 8% of floor area of the C&I sector. Similarly, but to a lesser degree, small establishments comprised 15% of the establishments and used 7% of both the energy and the floor area.

At the other end of the spectrum, the very large floor area category represented only 2% of the C&I sector establishments, yet accounted for 46% of total C&I sector floor area and 47% of this sector's energy consumption.

4.2 Key variables by floor area category and by activity grouping

Table 7 illustrates the main characteristics of C&I establishments for all floor area categories by sector.

As seen in section 1.1, some activities occupied, on average, smaller locations while other activities tended to occupy larger locations. Food Service and Drinking Places was the activity grouping with the largest proportion of very small establishments (80%). It was followed closely by the sub-activity Ambulatory Health Care, which had 78% of its establishments in the category. Surprisingly, more than 50% of the Wholesale and Warehousing establishments were very small. This can be explained in part by the fact that Postal Services, and Couriers and Messengers establishments, which can be quite small and numerous (i.e. in all small communities across Canada), are captured in this activity grouping.

Close to two-thirds of Universities were very large. These very large Universities represented as much as 99% of the total floor area used by this subcategory in Canada and consume 99% of its energy. Hospitals showed a similar pattern with 42% of the establishments being very large and accounting for 91% of the total floor area and consuming 93% of the energy.

Table 7. Number of establishments, energy consumption and floor area by activity group, by floor area category, 2008

Activity Grouping	Variable	Very Small (less than 465 m ²)		Small (465 m ² to 929 m ²)		Medium (930 m ² to 4645 m ²)		Large (4646 m ² to 9290 m ²)		Very Large (more than 9290 m ²)	
Wholesale and Warehousing	Number of establishments	23 095	A	6 403	B	12 159	A	2 136	B	1 901	B
	Energy consumption (GJ)	6 974 338	A	3 516 438	A	27 724 975	A	13 867 679	B	29 223 988	C
	Floor area (m ²)	5 876 414	A	4 373 486	B	25 768 831	A	14 402 323	B	42 445 834	B
Retail Trade	Number of establishments	65 878	A	13 508	A	19 016	A	1 799	C		F
	Energy consumption (GJ)	21 509 839	A	10 346 595	A	43 996 812	A	14 334 452	B		F
	Floor area (m ²)	12 846 438	A	8 440 202	A	36 604 043	A	13 225 945	B		F
• Non-food retail	Number of establishments	53 484	A	10 734	A	15 646	A	1 654	C		F
	Energy consumption (GJ)	14 349 067	A	7 534 975	B	26 237 170	A	10 882 540	C		F
	Floor area (m ²)	10 164 049	A	6 698 226	A	28 906 413	A	12 330 592	C		F
• Food retail	Number of establishments	12 395	A	2 774	B	3 370	A		F		F
	Energy consumption (GJ)	7 160 773	A	2 811 620	B	17 759 642	A		F		F
	Floor area (m ²)	2 682 388	A	1 741 976	B	7 697 630	A		F		F
Information and Cultural	Number of establishments	3 301	A	1 232	B	2 096	A	162	C		F
	Energy consumption (GJ)	702 045	A	929 749	C	5 332 943	B	1 018 250	C		F
	Floor area (m ²)	596 728	A	830 215	B	4 222 312	A	1 046 447	C		F
Financial, Real Estate and Other Professional Services	Number of establishments	59 842	A	7 402	B	7 279	B		F		F
	Energy consumption (GJ)	13 438 992	A	5 003 548	B	15 965 490	C		F		F
	Floor area (m ²)	12 305 833	A	4 806 825	B	16 520 943	C		F		F
Public Administration	Number of establishments	3 190	A	1 405	B	1 478	A	508	C	507	B
	Energy consumption (GJ)	880 838	A	1 413 479	B	3 314 411	B	7 198 176	C	61 663 665	C
	Floor area (m ²)	735 874	A	985 269	A	2 878 858	A	3 021 507	C		F
Education	Number of establishments	4 189	A	1 320	B	10 370	A	3 761	A	1 858	B
	Energy consumption (GJ)	892 335	B	963 811	C	22 706 235	A	22 132 158	B	90 864 985	A
	Floor area (m ²)	699 963	A	869 502	B	27 631 060	A	24 116 747	A	65 985 605	A
• Elementary and secondary schools	Number of establishments		F		F	9 540	A	3 530	A	1 292	C
	Energy consumption (GJ)		F		F	20 479 732	A	18 802 149	B		F
	Floor area (m ²)		F		F	25 876 775	A	22 525 213	A	19 421 065	C

Table 7. Number of establishments, energy consumption and floor area by activity group, by floor area category, 2008 (continued)

Activity Grouping	Variable	Very Small (less than 465 m ²)		Small (465 m ² to 929 m ²)		Medium (930 m ² to 4645 m ²)		Large (4646 m ² to 9290 m ²)		Very Large (more than 9290 m ²)	
• Community colleges and CEGEPs	Number of establishments	304	B	206	C	272	B		F		F
	Energy consumption (GJ)		F	116 830	C	813 580	C		F		F
	Floor area (m ²)	70 451	B	146 128	C	580 305	B		F		F
• Universities	Number of establishments		F		F	29	B	42	B	164	A
	Energy consumption (GJ)	1 053	C		F		F	309 041	B	53 946 566	A
	Floor area (m ²)		F		F	84 600	C	296 292	B	31 668 696	B
• Business Schools and Others	Number of establishments	3 302	A	760	B	528	B		F		F
	Energy consumption (GJ)	507 610	A	408 028	C	1 276 487	C		F		F
	Floor area (m ²)	535 984	A	482 772	B	1 089 380	B		F		F
Health Care	Number of establishments	33 935	A	7 134	A	8 534	B	1 013	C	1 475	B
	Energy consumption (GJ)	6 516 795	A	4 286 481	A	21 785 240	B		F	81 581 513	B
	Floor area (m ²)	6 116 736	A	4 671 877	A	16 409 291	B		F	38 269 098	B
• Ambulatory health care services	Number of establishments	28 206	A	3 009	C	4 673	C		F		F
	Energy consumption (GJ)	4 988 879	B		F		F		F		F
	Floor area (m ²)	4 786 782	A	1 845 729	C		F		F		F
• Hospitals	Number of establishments		F		F	203	A	158	B	290	A
	Energy consumption (GJ)		F		F	1 112 655	B	2 121 646	B	43 257 635	B
	Floor area (m ²)		F		F	519 819	A	1 028 191	B	15 798 596	A
• Nursing and residential care facilities	Number of establishments		F		F	1 913	A	678	B	752	A
	Energy consumption (GJ)		F		F	6 140 489	A	4 372 867	B	26 761 417	B
	Floor area (m ²)		F		F	4 573 296	A	4 589 365	B	15 353 730	B
• Social assistance	Number of establishments	4 901	A	3 057	A	1 745	A		F		F
	Energy consumption (GJ)	1 326 899	A	2 229 321	B	3 683 737	A		F		F
	Floor area (m ²)	1 158 851	A	2 150 120	B	3 286 801	A		F		F
Accommodation Services	Number of establishments	1 480	B	2 432	A	2 088	A	737	B	777	B
	Energy consumption (GJ)	781 549	C	3 066 115	B	6 521 076	A	6 294 083	C	46 304 082	C
	Floor area (m ²)	353 990	B	1 851 698	A	4 429 861	A	4 660 110	B	26 159 869	B

Table 7. Number of establishments, energy consumption and floor area by activity group, by floor area category, 2008 (continued)											
Activity Grouping	Variable	Very Small (less than 465 m ²)		Small (465 m ² to 929 m ²)		Medium (930 m ² to 4645 m ²)		Large (4646 m ² to 9290 m ²)		Very Large (more than 9290 m ²)	
Food Services and Drinking Places	Number of establishments	37 340	A	7 977	B	1 067	C		F		F
	Energy consumption (GJ)	28 260 803	A	15 202 434	B		F		F		F
	Floor area (m ²)	7 816 604	A	5 120 220	B	2 254 177	C		F		F
Religious Organizations	Number of establishments	8 179	A	10 290	A	11 181	A	875	C		F
	Energy consumption (GJ)	3 539 038	B	7 226 823	A	18 545 913	A	4 310 499	C		F
	Floor area (m ²)	2 560 483	A	7 141 317	A	21 562 464	A	6 340 413	C		F
Other Services ¹	Number of establishments	46 714	A	12 165	A	9 798	A		F	418	B
	Energy consumption (GJ)	14 675 287	A	11 405 559	A	23 879 563	B		F		F
	Floor area (m ²)	9 487 759	A	8 331 928	A	18 263 619	A		F	19 474 469	C
Total	Number of establishments	287 142	A	71 269	A	85 066	A	15 271	A	10 370	A
	Energy consumption (GJ)	98 171 860	A	63 361 032	A	194 784 499	A	105 529 038	A	404 200 733	A
	Floor area (m²)	59 396 821	A	47 422 537	A	176 545 460	A	98 587 372	A	323 235 836	A

The letter to the right of each estimate indicates its quality, as follows: A – Very good, B – Acceptable, C – Use with caution, F – Too unreliable to be published or suppressed for reasons of confidentiality.

Due to rounding, numbers may not add up to the total shown, and some numbers may differ slightly from one table to the next.

¹ The residual category "Other Services" includes the categories *Arts, Entertainment and Recreation* (NAICS 71) and *Other services except religious organizations* (NAICS 81, except 813110).

4.3 Energy intensity by floor area category and by activity grouping

Table 8 shows the energy intensity in the C&I Sector, by activity grouping and floor area category. CICES 2008 observed lower energy intensities for larger establishments in Retail Trade, Financial, Real Estate and Other Professional Services, and Religious Organizations.

The Religious Organizations activity grouping had some of the lowest energy intensities for every floor area category, one of the reasons being that they do not use much energy consuming equipment. They also have reduced hours of operations. For similar reasons, a low energy intensity was observed for

the Wholesale and Warehousing, which generally requires less space and water heating than other establishments in the sector.

The Health Care activity was characterized by low energy intensities for very small establishments (1.07 GJ/m²) and high energy intensities for very large ones (2.13 GJ/m²). The distribution between the floor area categories of different types of establishments can explain this observation: a high number of Ambulatory Health Care Services (over 28 thousand establishments), which tend to have lower energy intensities, were in the very small category. However, Hospitals, which are characterized by the use of specialized, energy-intensive equipment and 24-hour operations, tended to occupy the very large category.

Table 8. Energy intensity of establishments by activity grouping, by floor area category, 2008

Activity Grouping	Energy Intensity (GJ/m ²)											
	Very Small (less than 465 m ²)		Small (465 m ² to 929 m ²)		Medium (930 m ² to 4645 m ²)		Large (4646 m ² to 9290 m ²)		Very Large (more than 9290 m ²)		Canada	
Wholesale and Warehousing	1.19	A	0.80	A	1.08	A	0.96	A	0.69	B	0.88	A
Retail Trade	1.67	A	1.23	A	1.20	A	1.08	B		F	1.09	A
• Non-food retail	1.41	A	1.12	A	0.91	A	0.88	B		F	0.88	A
• Food retail	2.67	A	1.61	A	2.31	A		F	1.92	A	2.39	A
Information and Cultural	1.18	A	1.12	B	1.26	B	0.97	B	1.61	A	1.36	A
Financial, Real Estate and Other Professional Services	1.09	A	1.04	A	0.97	B	0.87	B	0.86	A	0.92	A
Public Administration	1.20	A	1.43	A	1.15	A	2.38	B	1.89	B	1.85	A
Education	1.27	B	1.11	B	0.82	A	0.92	A	1.38	A	1.15	A
• Elementary and secondary schools		F		F	0.79	A	0.83	A	0.96	A	0.86	A
• Community colleges and CEGEPs	1.78	C	0.80	A	1.40	B	2.81	C	1.21	A	1.32	A
• Universities	0.50	A	0.54	A	1.61	C	1.04	A	1.70	A	1.70	A
• Business Schools and Others	0.95	A	0.85	A	1.17	A	0.40	A	1.58	B	1.04	A
Health Care	1.07	A	0.92	A	1.33	A	1.99	C	2.13	A	1.77	A
• Ambulatory health care services	1.04	A	0.63	C	1.35	A		F		F	1.80	C
• Hospitals	2.71	B	5.97	A	2.14	A	2.06	A	2.74	A	2.68	A
• Nursing and residential care facilities	1.16	A	1.17	A	1.34	A	0.95	A	1.74	A	1.51	A
• Social assistance	1.15	A	1.04	A	1.12	A	1.86	C	0.76	B	0.97	A
Accommodation Services	2.21	B	1.66	A	1.47	A	1.35	A	1.77	A	1.68	A
Food Services and Drinking Places	3.62	A	2.97	A	2.22	B	5.21	A	3.22	C	3.20	A
Religious Organizations	1.38	B	1.01	A	0.86	A	0.68	A		F	0.72	A
Other Services ¹	1.55	A	1.37	A	1.31	A		F	1.12	B	1.21	A
Canadian C&I Sector	1.65	A	1.34	A	1.10	A	1.07	A	1.25	A	1.23	A

The letter to the right of each estimate indicates its quality, as follows: A – Very good, B – Acceptable, C – Use with caution, F – Too unreliable to be published or suppressed for reasons of confidentiality.

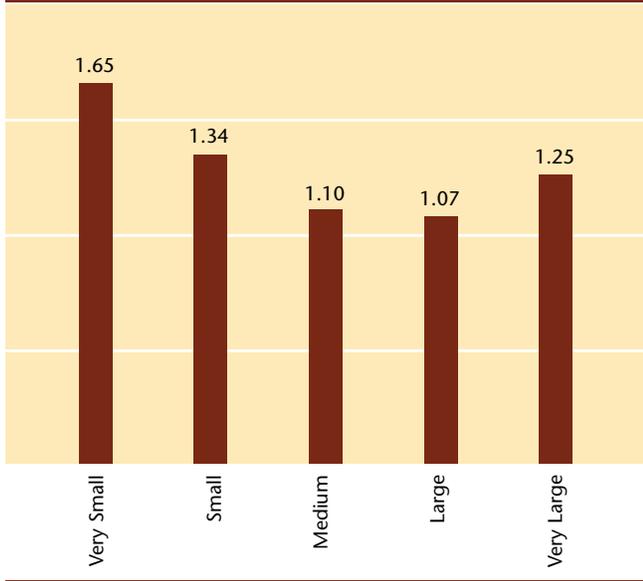
Due to rounding, numbers may not add up to the total shown, and some numbers may differ slightly from one table to the next.

¹ The residual category "Other Services" includes the categories *Arts, Entertainment and Recreation* (NAICS 71) and *Other services except religious organizations* (NAICS 81, except 813110).

Based on floor area categories, survey results show that energy intensity levels of establishments decreased as floor area increased (see Figure 14). However, this observation was not valid in the case of very large establishments as CICES 2008 found that their intensity (1.25 GJ/m²) was higher than that of large establishments (1.07 GJ/m²). The high

energy intensity for very large establishments can be explained by the predominance of the Hospitals and Universities in this floor area category. Nearly 50% of Hospitals and Universities were this size, and as seen before, these establishments tended to have high energy intensities.

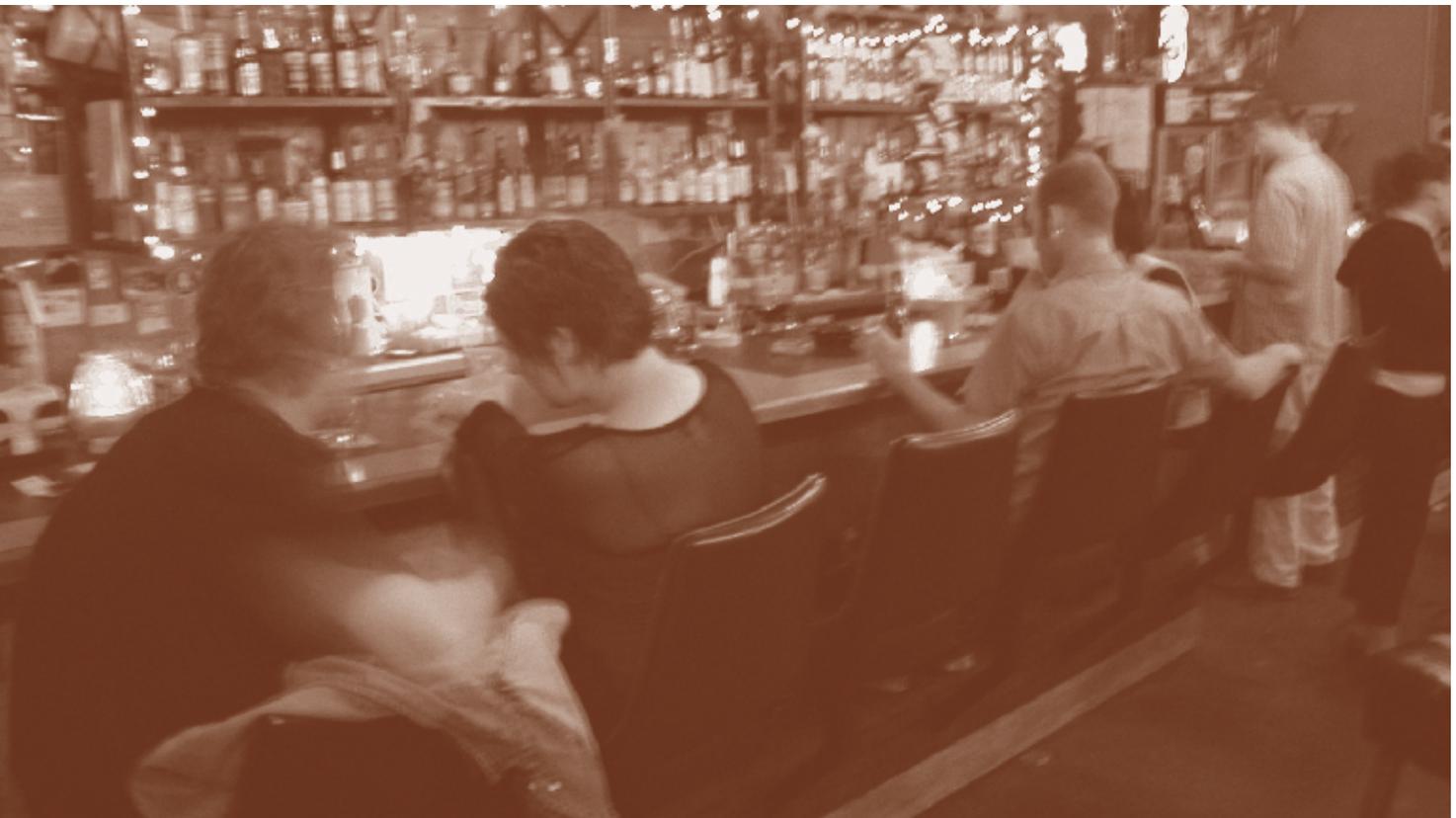
FIGURE 14 Energy intensity (GJ/m²) by floor area category, 2008



The most energy intensive establishments based on floor area categories were the very small establishments in 2008 (1.65 GJ/m²). One factor

contributing to this result is the prevalence of Food Service and Drinking Places establishments in this floor area category. These establishments were the most energy intensive, based on activity grouping in the C&I sector in 2008 (see Figure 5). While these establishments accounted for only 13% of the total floor area of establishments in this floor area category, they also accounted for 29% of the floor area category's energy consumption. The result of this relatively small amount of floor area along with high energy consumption was a high energy intensity (3.62 GJ/m²) for these establishments. This result, in turn, contributed to the high intensity level for all very small establishments.

Finally, large establishments had the lowest energy intensity at 1.07 GJ/m² in 2008. As can be observed in Table 7, almost 50% of large establishments were in three activities with relatively low energy intensities: Non-Food Retail, Elementary and Secondary Schools, and Wholesale and Warehousing.



5 Building Age

CICES 2008 gathered data on the age of the building containing/housing the establishment. For establishments that occupied several buildings (e.g. a university campus or hospital complex), the age of the majority of buildings occupied by the establishment was selected. As shown in Figure 15, the average age of buildings housing C&I establishments in Canada in 2008 was estimated at nearly 35 years. The oldest buildings tended to be in Ontario and Quebec, whereas the newest tended to be in the West. The two extremes, Ontario (38.4) and British Columbia (31.2), had a seven-year difference in their average age. The result for the Prairies was very similar to that of B.C., while there was a 1 year difference between Quebec and Atlantic Canada.

FIGURE 15 Average age (in years) of establishments' buildings by region, 2008

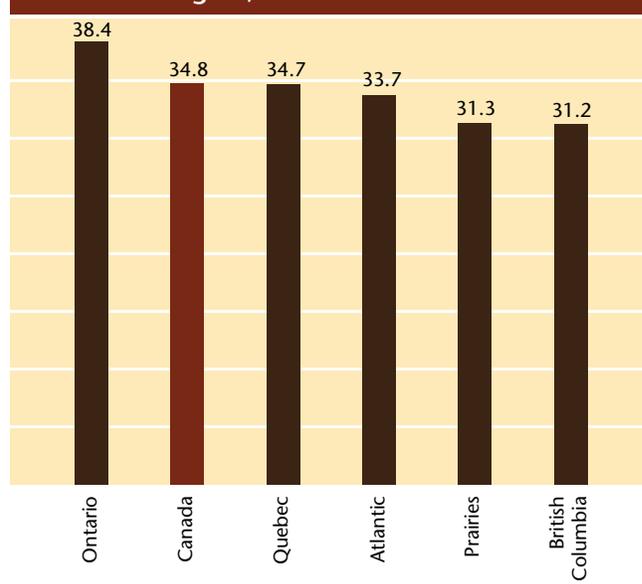


Table 9 presents the principal characteristics of C&I establishments, based on the year that their building was constructed.

Table 9. Number of establishments, energy consumption, floor area, average floor area and energy intensity by building year of construction, 2008

Building Year of Construction	Number of Establishments		Energy Consumption (GJ)		Floor Area (m ²)		Average Floor Area per Establishment (m ²)		Energy Intensity (GJ/m ²)	
Before 1920	34 348	A	33 077 803	A	34 964 499	A	1 018	A	0.95	A
1920–1959	57 726	A	135 256 373	B	133 682 989	C	2 316	C	1.01	A
1960–1969	63 048	A	157 008 322	A	111 354 473	A	1 766	A	1.41	A
1970–1979	80 284	A	146 555 772	A	103 826 854	A	1 293	A	1.41	A
1980–1989	98 161	A	160 500 044	A	112 044 177	A	1 141	A	1.43	A
1990–1999	62 447	A	116 784 272	A	99 855 815	A	1 599	A	1.17	A
2000 or later	73 104	A	116 864 576	A	109 459 218	B	1 497	B	1.07	A
Canadian C&I Sector	469 118	A	866 047 162	A	705 188 026	A	1 503	A	1.23	A

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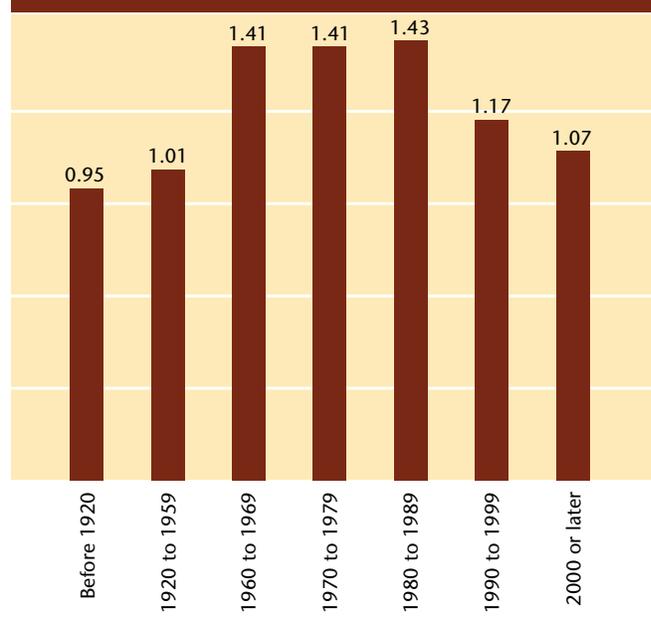
In Canada, only 7% of the buildings occupied by C&I establishments were built before 1920, while 16% were built between 2000 and 2008.

The data gathered through this survey allowed for a comparison of a building's year of construction with its energy intensity. Figure 16 details the energy intensity for each construction period. With the exception of the first two periods, the least energy intensive buildings tended to be the newest. Buildings built in 2000 or later had the third lowest energy intensity, at 1.07 GJ/m², a ratio that is 9% less than for those built in the preceding decade (1.17 GJ/m²). The buildings built before 1920 had the lowest energy intensity with 0.95 GJ/m², while the highest could be found in those built between 1960 and 1989.

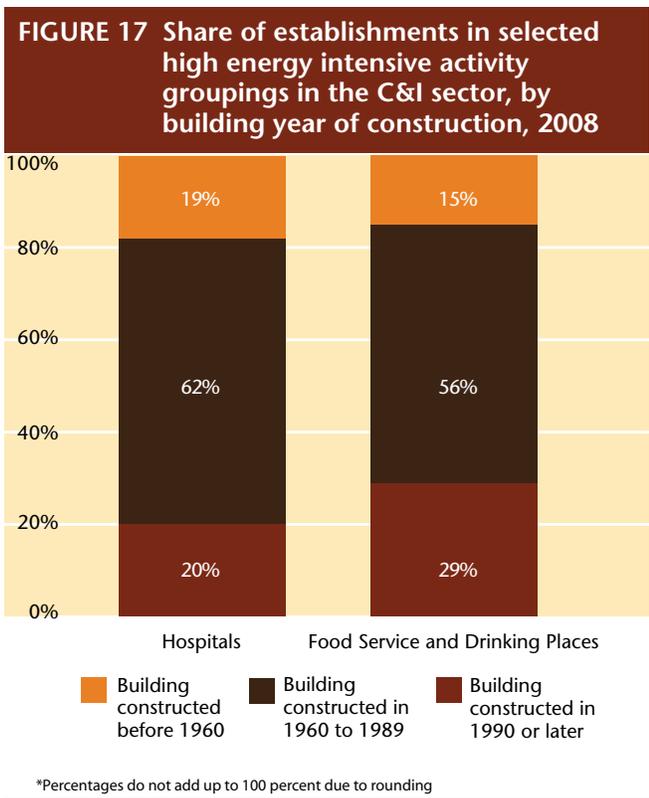
The observed low intensity in buildings constructed before 1920 could be partially attributed to the fact that only 58% of these buildings were space cooled. This proportion was significantly lower than the 72% of buildings constructed in 1920 or later which were space cooled. Another factor that influenced the low intensities in the two oldest building categories was that 53% of the buildings occupied by Religious Organizations were constructed during these time periods and, as seen in Figure 5, this activity grouping had the lowest intensity (0.72 GJ/m²) of any grouping in the C&I sector.

The low energy intensities observed in newer buildings (built in 1990 or later) could be explained by the tendency of the new construction to be built according to increasingly rigorous standards and equipped with more energy-efficient technology and materials.

FIGURE 16 Energy intensity (GJ/m²) by building year of construction, 2008



Furthermore, it is important to examine the relative impact of the construction period on energy intensity in association with other establishment characteristics. For instance, as seen in Section 1, the establishment's activity plays a fundamental role in its energy intensity. This analysis demonstrated that Hospitals, and Food Service and Drinking Places establishments were among the most intensive in the C&I sector (as seen in Table 1). Moreover, as can be observed in Figure 17, the majority of these energy intensive establishments were located in buildings constructed between 1960 and 1989 (62% and 56% respectively). This cluster of high energy intensive establishments was one factor that appears to have impacted the energy intensity levels of establishments that occupied buildings constructed between 1960 and 1989.



6 Energy Sources Used for Space Heating, Space Cooling and Water Heating

CICES 2008 collected data on the type of energy used for space heating, space cooling and water heating. In the case of space heating and cooling, a distinction between primary and secondary energy sources was made.

6.1 Space heating

Almost all C&I establishments (more than 99.5%) were at least partially space heated.

Table 10 shows the number of establishments that used a given energy source for space heating, by region, focusing on the primary energy source used.

In Canada, 88% of the C&I sector establishments used either natural gas (52%) or electricity (36%) as their primary energy source for space heating.

From a regional perspective, electricity was the most widely used primary energy source in Quebec and the Atlantic region where 66% and 57% of establishments, respectively, used it as their primary heating energy. Natural gas was most popular in Ontario, the Prairies and British Columbia, with usage rates of 73%, 74% and 52% respectively. The lowest rate of natural gas use was in the Atlantic region at 5%. However, this region had the highest percentage of users of light fuel oil and other fuels in Canada (38%).

These observed variations in regional energy sources used for space heating in the C&I sector are consistent with variations seen in the residential sector.¹⁵ Therefore, it can be concluded that the type of energy source used is primarily based on regional location of the user.

Table 10. Number of establishments by primary energy source for space heating, by region, 2008

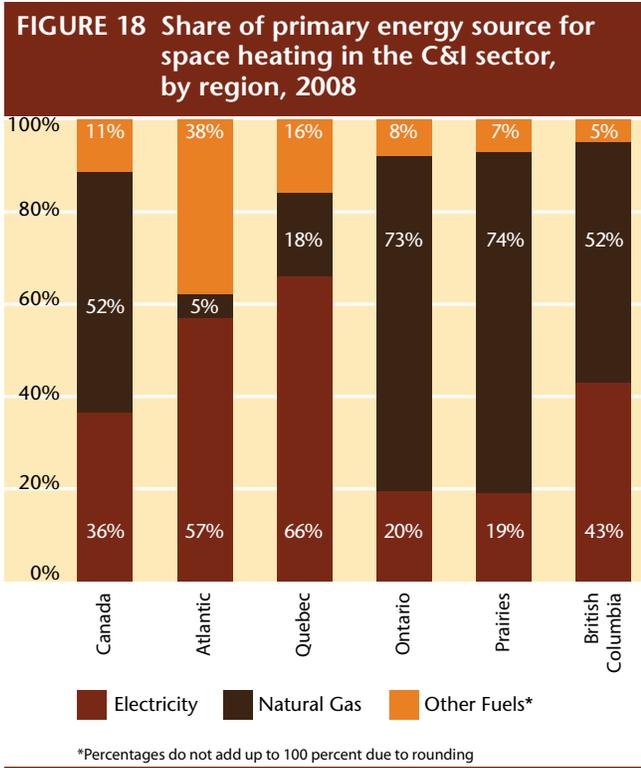
Number of Establishments												
Energy Source	Canada		Atlantic		Quebec		Ontario		Prairies		British Columbia	
Electricity	170 393	A	20 672	A	68 834	A	33 705	A	16 272	A	30 910	A
Natural Gas	243 604	A	1 884	B	18 350	A	123 261	A	62 607	A	37 503	A
Other*	53 009	A	13 782	A	16 425	A	12 799	B	6 116	B	3 887	B
Total	467 006	A	36 338	A	103 609	A	169 764	A	84 996	A	72 300	A

*Other fuels include light fuel oil, propane, heavy fuel oil, diesel, steam, wood and other types.

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¹⁵ Natural Resources Canada, 2007 Survey of Household Energy Use – Summary Report, p.26. <http://oee.nrcan.gc.ca/Publications/statistics/sheu-summary07/index.cfm?attr=0>

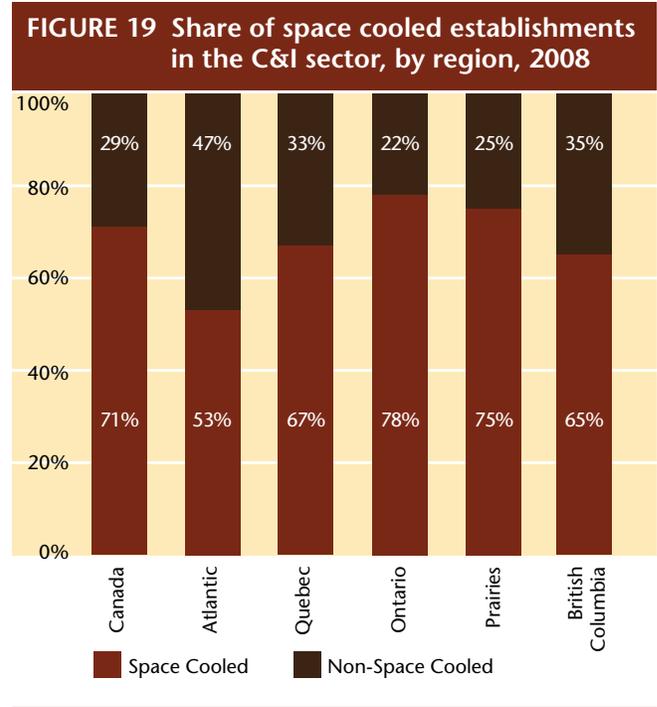


*Other fuels include light fuel oil, propane, heavy fuel oil, diesel, steam, wood and other types.

6.2 Space cooling

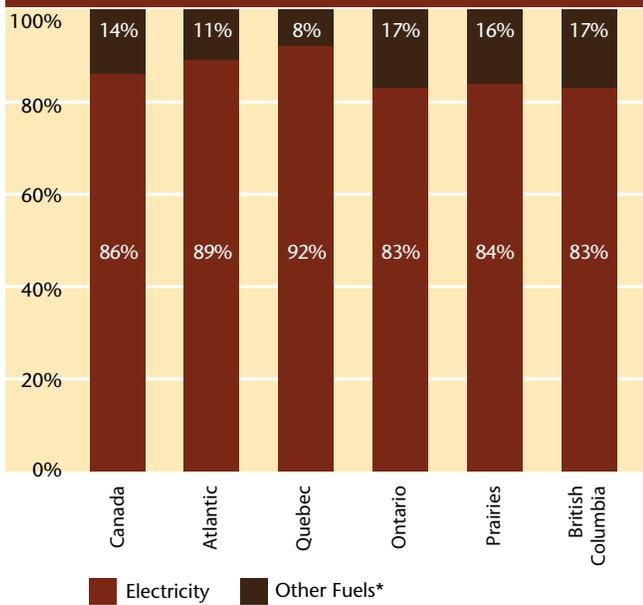
According to CICES 2008 estimates, 71% of the C&I sector establishments were at least partially space cooled.

As shown in Figure 19, the proportion of establishments that were cooled varied across Canada. While the lowest proportion of cooled establishments were found in British Columbia and Atlantic Canada, 65% and 53% respectively, the Prairies and Ontario displayed the highest rates at 75% and 78% respectively.



Electricity was, by a wide margin, the most widely used energy source for space cooling across all regions (see Figure 20). At the Canadian level, the second most used fuel for space cooling was natural gas, used by 12% of the cooled establishments.

FIGURE 20 Share of primary energy sources for space cooling in the C&I sector, by region, 2008



*Other fuels include natural gas, light fuel oil, propane, diesel, heavy fuel oil and other types.

In 2008, only 6% of all air-conditioned establishments used more than one energy source for space cooling. Those who used electricity as their primary energy source for space cooling often used natural gas as their secondary energy source, and vice-versa.

6.3 Water heating

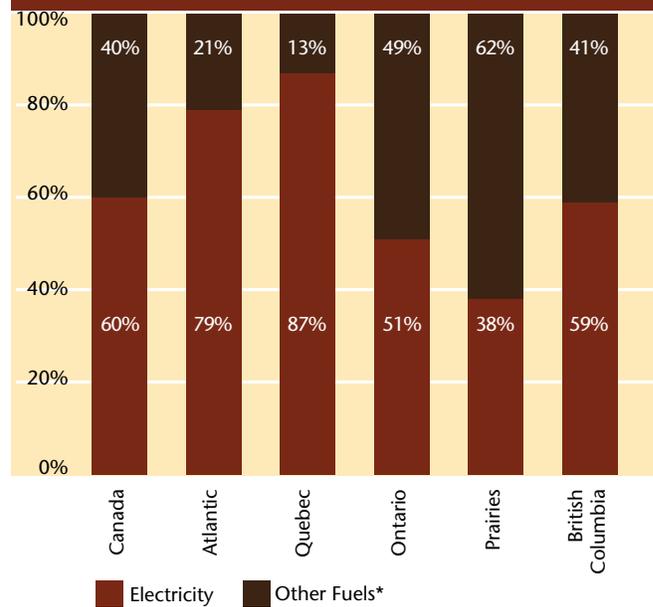
According to CICES 2008 estimates, 97% of all C&I establishments heated water. This rate varied from 93% in Quebec to 99% in British Columbia.

Electricity was the main energy source for water heating in Canada, providing power to 60% of establishments that had water heaters. By comparison, 35% of establishments with water heating used natural gas and only 5% used other fuels.

From a regional perspective, electricity was again a widely used energy source in the Atlantic region and Quebec where it provided the energy for water heating to 79% and 87% of the establishments,

respectively (see Figure 21). This proportion fell to 51% in Ontario, where natural gas took a 45% share. C&I establishments in British Columbia mostly used electricity (59%) for their hot water needs. Finally, the Prairies were the only region where the majority of establishments did not use electricity to heat their water.

FIGURE 21 Share of primary energy sources for water heating in the C&I sector, by region, 2008



*Other fuels include natural gas, light fuel oil, propane, diesel, heavy fuel oil, renewable, steam, wood and other types.

7 Use of Auxiliary Equipment

According to the annual OEE Energy Use Data Handbook, auxiliary equipment use represented 17% of the energy used by the C&I sector in 2007.¹⁶ It ranked second in terms of energy end-uses after space heating (50%), and ahead of lighting (10%) and water heating (8%). As a result, CICES examined the prevalence of auxiliary equipment in the C&I sector in 2008.

Auxiliary equipment comprises appliances that are plugged directly into an electrical outlet. For the purposes of this survey the types of auxiliary equipment used in the C&I sector included

- computers (including electronic devices with a microprocessor such as cash registers, but excluding battery-operated and handheld devices)
- computer servers
- printers (or photocopiers or fax machines)
- domestic appliances (e.g. stoves, microwave ovens, refrigerators, freezers, and dishwashers)
- laundry washers and dryers
- industrial food appliances
- medical appliances such as diagnosis or treatment machines (e.g. X-ray, CAT scan, MRI, dialysis, and ultrasound)
- sterilizing machines
- vending machines
- automatic teller machines (ATMs or bank machines)

Table 11 illustrates the auxiliary equipment used per activity sector. According to the survey, almost 16 million units of auxiliary equipment (as previously defined) were used. Computers were the most commonly used piece of equipment across the C&I sector, at 8.7 million units (55%). One quarter of all computers used in the C&I sector were used in the Education activity grouping, mainly in Elementary and Secondary Schools.

Printers were the second most used units of equipment (16%), while domestic appliances were third (15%). Not surprisingly, laundry, medical and sterilizing equipment were primarily used by the Health Care activity grouping (in proportion of 34%, 91% and 55% respectively).

¹⁶ Natural Resources Canada, Energy Use Data Handbook 1990–2007, p. 48–49. http://oee.nrcan.gc.ca/corporate/statistics/neud/dpa/tableshandbook2/com_00_1_e_4.cfm?attr=0

Table 11. Number of pieces of equipment used by establishments, by activity grouping, 2008

Activity Grouping	Computers	Computer Servers	Printers	Domestic Appliances	Commercial Food Appliances	Laundry	Medical Appliances	Sterilizing Machines	Vending Machines	ATM Machines	Total
Wholesale and Warehousing	984 911 B	74 226 A	319 967 A	140 715 A	18 107 B	6 547 B	F		21 952 A	1 295 C	1 570 542 A
Retail Trade	786 711 A	69 579 A	371 028 A	267 567 A	120 372 A	8 776 B	F		F	F	1 754 847 A
• Non-food retail	686 519 A	56 270 A	327 712 A	213 568 A	13 979 B	5 888 B	F		F	F	1 419 823 A
• Food retail	100 192 B	13 309 A	43 316 A	53 999 A	106 393 A	F	-		F	4 527 B	335 025 A
Information and Cultural	360 656 B	41 185 B	62 161 A	29 741 B	2 529 C	F	-		F	3 592 B	501 056 B
Financial, Real Estate and Other Professional Services	F	F	575 663 B	308 975 B	F	9 625 C	4 407 C	F	32 805 C	F	3 641 828 C
Public Administration	F	17 435 B	F	57 989 B	F	5 592 C	F		F	7 868 C	589 968 C
Education	2 173 590 A	71 159 A	344 421 A	246 129 A	42 989 A	30 800 A	1 038 C	2 820 B	40 379 A	1 676 A	2 955 001 A
• Elementary and secondary schools	1 181 481 A	22 324 A	156 702 A	144 706 A	26 908 B	17 698 A	-		F	24 210 A	1 574 959 A
• Community colleges and CEGEPs	405 110 B	F	43 319 B	F	8 448 B	5 012 C	815 C	813 B	7 509 B	486 B	533 471 B
• Universities	538 272 A	30 211 B	128 311 B	41 589 A	5 959 A	7 338 B	222 B	1 330 C	6 297 A	348 A	759 876 A
• Business Schools and Others	F	3 240 C	16 089 A	13 261 B	F	752 B	-		2 363 B	F	86 694 C
Health Care	725 723 B	F	309 535 A	512 505 B	56 180 A	82 646 A	83 982 A	37 746 A	12 539 B	5 637 C	1 883 509 B
• Ambulatory health care services	F	F	122 878 B	101 572 B	F	19 771 B	63 185 A	32 247 A	F	4 814 C	F
• Hospitals	233 013 A	11 409 A	85 854 A	38 978 A	11 313 A	5 346 A	F	2 722 A	4 017 A	378 A	410 720 A
• Nursing and residential care facilities	F	6 209 B	54 882 C	200 050 A	28 834 A	32 021 A	F	2 534 B	6 062 B	F	446 350 B
• Social assistance	106 907 A	10 653 B	45 921 A	F	11 294 B	25 508 B	F	244 C	1 916 B	F	374 579 B
Accommodation Services	87 442 B	7 431 C	39 268 A	275 424 A	51 532 A	28 241 A	-	555 C	13 231 A	3 443 A	506 567 A
Food Services and Drinking Places	131 751 A	21 984 A	64 765 A	174 772 A	330 440 A	F	-	8 439 B	5 441 C	6 375 B	767 836 A
Religious Organizations	159 315 A	12 325 A	99 558 A	198 291 A	32 103 A	18 763 A	F	1 586 C	2 752 B	F	525 076 A
Other Services ¹	456 442 B	50 994 B	202 197 A	180 792 A	105 525 B	28 509 A	F	7 312 B	20 439 A	8 035 B	1 060 403 A
Total	8 712 401 A	636 149 C	2 510 951 A	2 392 699 A	773 659 A	243 879 A	92 251 A	69 000 A	245 211 B	F	15 756 633 A

The letter to the right of each estimate indicates its quality, as follows: A – Very good, B – Acceptable, C – Use with caution, F – Too unreliable to be published or suppressed for reasons of confidentiality. Due to rounding, numbers may not add up to the total shown, and some numbers may differ slightly from one table to the next.

¹ The residual category "Other Services" includes the categories Arts, Entertainment and Recreation (NAICS 71) and Other services except religious organizations (NAICS 81, except 813110).

■ APPENDIX A — CLASSIFICATION OF COMMERCIAL & INSTITUTIONAL ESTABLISHMENTS

For the purposes of CICES 2008, the establishments were classified in accordance with the 2007 North America Industry Classification System (NAICS).¹⁷

Wholesale and Warehousing (NAICS 41, 49)

- Farm Product Wholesaler-Distributors; Petroleum Product Wholesaler-Distributors; Food, Beverage and Tobacco Wholesaler-Distributors; Personal and Household Goods Wholesaler-Distributors; Motor Vehicle and Parts Wholesaler-Distributors; Building Material and Supplies Wholesaler-Distributors; Machinery, Equipment and Supplies Wholesaler-Distributors; Miscellaneous Wholesaler-Distributors; Wholesale Electronic Markets, and Agents and Brokers;
- Postal Service; Couriers and Messengers; Warehousing and Storage

Retail Trade (NAICS 44, 45)

Non-Food Retail Trade (NAICS 44 (except 445), 45)

- Motor Vehicle and Parts Dealers; Furniture and Home Furnishings Stores; Electronics and Appliance Stores; Building Material and Garden Equipment and Supplies Dealers; Health and Personal Care Stores; Gasoline Stations; Clothing and Clothing Accessories Stores
- Sporting Goods, Hobby, Book and Music Stores; General Merchandise Stores; Miscellaneous Store Retailers; Non-Store Retailers

Food Retail (NAICS 445)

- Grocery Stores; Specialty Food Stores; Beer, Wine and Liquor Stores

Information and Cultural Industries (NAICS 51)

- Publishing Industries (except Internet); Motion Picture and Sound Recording Industries; Broadcasting (except Internet); Telecommunications; Data Processing, Hosting, and Related Services; Other Information Services

Financial, Real Estate and Other Professional Services (NAICS 52, 53, 54)

- Monetary Authorities - Central Bank; Credit Intermediation and Related Activities; Securities, Commodity Contracts, and Other Financial Investment and Related Activities; Insurance Carriers and Related Activities; Funds and Other Financial Vehicles
- Real Estate; Rental and Leasing Services; Lessors of Non-Financial Intangible Assets (except Copyrighted Works)
- Professional, Scientific and Technical Services

Public Administration (NAICS 91)

- Federal Government Public Administration; Provincial and Territorial Public Administration; Local, Municipal and Regional Public Administration; Aboriginal Public Administration; International and Other Extra-Territorial Public Administration

Education (NAICS 61)

Elementary and Secondary Schools (NAICS 6111)

Community Colleges and C.E.G.E.P.s (NAICS 6112)

Universities (NAICS 6113)

Business Schools and Others (NAICS 6114 to 6117)

- Business Schools and Computer Management Training; Technical and Trade Schools; Other Schools and Instruction; Educational Support Services

¹⁷ Statistics Canada, <http://www.statcan.gc.ca/subjects-sujets/standard-norme/naics-scian/2007/index-indexe-eng.htm>.

Health Care (NAICS 62)*Ambulatory Health Care Services (NAICS 621)*

- Offices of Physicians; Offices of Dentists; Offices of Other Health Practitioners; Out-Patient Care Centres; Medical and Diagnostic Laboratories; Home Health Care Services; Other Ambulatory Health Care Services

Hospitals (NAICS 622)

- General Medical and Surgical Hospitals; Psychiatric and Substance Abuse Hospitals; Specialty (except Psychiatric and Substance Abuse) Hospitals

Nursing and Residential Care Facilities (NAICS 623)

- Nursing Care Facilities; Residential Developmental Handicap, Mental Health and Substance Abuse Facilities; Community Care Facilities for the Elderly; Other Residential Care Facilities

Social Assistance (NAICS 624)

- Individual and Family Services; Community Food and Housing, and Emergency and Other Relief Services; Vocational Rehabilitation Services; Child Day-Care Services

Accommodation Services (NAICS 721)

- Traveller Accommodation; RV (Recreational Vehicle) Parks and Recreational Camps; Rooming and Boarding Houses

Food Services and Drinking Places (NAICS 722)

- Full-Service Restaurants; Limited-Service Eating Places; Special Food Services; Drinking Places (Alcoholic Beverages)

Religious Organizations (NAICS 8131)**Other Services (NAICS 71, 81 (except 8131, 814))**

- Performing Arts Companies; Spectator Sports; Promoters (Presenters) of Performing Arts, Sports and Similar Events; Agents and Managers for Artists, Athletes, Entertainers and Other Public Figures; Independent Artists, Writers and Performers; Heritage Institutions; Amusement Parks and Arcades; Gambling Industries; Other Amusement and Recreation Industries
- Automotive Repair and Maintenance; Electronic and Precision Equipment Repair and Maintenance; Commercial and Industrial Machinery and Equipment (except Automotive and Electronic) Repair and Maintenance; Personal and Household Goods Repair and Maintenance; Personal Care Services; Funeral Services; Dry Cleaning and Laundry Services; Other Personal Services; Grant-Making and Giving Services; Social Advocacy Organizations; Civic and Social Organizations; Business, Professional, Labour and Other Membership Organizations

■ APPENDIX B — METHODOLOGY

This appendix summarizes the methodology used for CICES 2008.

Background

Statistics Canada, in partnership with Natural Resources Canada, conducted CICES 2008 to collect detailed information on the energy demand and consumption patterns of Canadian businesses, organizations and institutions. This survey collected data on the types and quantities of energy (such as electricity, natural gas, etc.) consumed by small, medium and large businesses, organizations and institutions in Canada.

Landlords of establishments who indicated that they paid all or some of the energy bills were asked to provide additional information on energy consumption.

Target population

The target and survey population for commercial establishments was all businesses with a minimum of 1 employee and a business location that was not a residence within selected NAICS codes. The predetermined NAICS codes for commercial establishments are listed in the sub-section on the creation of the frame in Table 1 (industries 1 to 14 as well as 19¹⁸ to 20).

The target population for institutions included hospitals and schools (primary, secondary, college and university). For colleges and universities, the survey population excluded the following school types: First Nations and Métis, government direct, apprenticeship, consortia and school board adult education. For primary and secondary school, the survey population excluded the following school types: Aboriginal, distance education (virtual/correspondence schools) and home schools.

The target population excludes establishments located in the territories.

Frame

The frame was created in February of 2009 from four mutually exclusive lists. The first list is comprised of colleges, CEGEPs and universities, while the second list includes hospitals. The third list is comprised of primary and secondary schools (private and public), while the fourth list is taken from the Business Register (BR) and is based on a NAICS code list that includes industries 1 to 14 as well as 19 and 20, from Table 1. All units taken from the BR are at the establishment level. In Table 1, in addition to the NAICS codes selected from the BR, the equivalent NAICS codes for units that came from lists other than the BR are supplied

Table 1. Frame Description

Frame Industry Number	Industry Name	NAICS
1	Wholesale Trade	41
2	Postal Service (491), Couriers and Messengers (492), Warehousing and Storage (493)	49
3	Retail Trade	44 (except 445) and 45
4	Food and Beverage Industries	445
5	Information and Cultural Industries	51
6	Finance and Insurance; Real Estate and Rental Leasing; Professional, Scientific and Technical Services	52, 53 and 54
7	Ambulatory Health Care Services	621
8	Nursing and Residential Care Facilities	623
9	Social Assistance	624
10	Arts, Entertainment and Recreation	71
11	Accommodation Services	721
12	Food Services and Drinking Places	722
13	Other Services (Except Public Administration)	81 (except 813110)
14	Public Administration	91
15	Colleges and CEGEPs	6112 (from list)
16	Universities	6113 (From list)

¹⁸ For industry 19 (religious organizations), there is no employee requirement. Therefore, religious organizations with no employees are included.

Frame Industry Number	Industry Name	NAICS
17	Hospitals	622 (From list)
18	Primary and Secondary Schools	6111 (Frame from Culture, Tourism and Centre for Education)
19	Religious Organizations	813110
20	Business Schools and Computer and Management Training, Technical and Trade Schools, Other Schools, Educational Support Services	6114, 6115, 6116, 6117

The following table gives the distribution of the population by industry:

Industry Number	Population
1	61 993
2	5 248
3	107 474
4	23 615
5	13 169
6	193 909
7	61 043
8	6 909
9	17 104
10	17 068
11	10 435
12	62 117
13	111 338
14	7 542
15	2 396
16	292
17	700
18	16 218
19	14 838
20	9 079
Total	742 487

Sampling

CICES 2008 is a sample survey. Statistics Canada used a regional stratified sampling plan based on industry; the final sample size was 9511 units. A simple random sample was selected from each stratum. The following table presents the sample sizes for each industry:

Industry Number	Sample Size
1	632
2	358
3	577
4	463
5	467
6	654
7	611
8	367
9	560
10	568
11	508
12	597
13	639
14	271
15	281
16	202
17	259
18	336
19	562
20	599
Total	9 511

Data collection

There was a telephone pre-contact to verify whether the units were in-scope and to confirm the mailing address. This was followed by a mail-out/mail-back questionnaire. Table 4 illustrates the sample distribution by final response code.

Table 4. Response Code Frequency from Collection

Description	Frequency
Complete	3 342
Combined report	5
Received but unusable	772
Partial	1
Temporarily inactive	26
Refusal	1 204
Non-response by survey deadline	851
Too late to mail	1
Unable to contact	32
Out of business	270
Unable to locate	2 164
Change of ownership	14
Amalgamation	6
Duplicate	21
Out of scope	784
Non-response by special subject matter officer	18
Total	9 511

Response Rate

The response rate calculated is the response rate at estimation. This response rate is based on the following formula:

$$\text{Response Rate} = \frac{\text{Number of Responding Usable Units (Complete and Partial)}}{\text{Number of resolved in-scope units + Number of estimated in-scope unresolved units}}$$

Overall Response Rate at estimation = 44.75%

Editing

For the 2008 survey, responses to the floor area and total energy consumption questions were considered mandatory. If a respondent did not complete both of these questions or there was an obvious error in one of the two questions, it was treated as a non-responding unit (after trying repeatedly to obtain valid responses from the respondent for these two questions). Completing both of these also allows for the computation of energy intensity for that unit. Additionally, it was felt that the accuracy of imputed values for these questions would be questionable. Therefore,

this approach was believed to be better than performing imputation.

Editing was performed on every variable asked on the main questionnaire. Also, a review of the top percentile(s) of units (one, two or five percentile) based on certain variables (such as area) was also performed as a means of detecting outliers or influential data.

Imputation

After the editing stage, blank values were filled in for variables with missing values. The imputation method used to fill in these blank values was nearest neighbour donor imputation. Donor groups for each question were formed using at least one of the following variable criteria depending on what needed to be imputed:

- industry type
- region
- energy sources used
- employee size category (based on BR count)
- building year of construction
- main energy source for space heating

The donor groups were first constructed using the variable criteria above that relate to the question being imputed. If some recipients do not find a donor using those selected variable criteria (due to a lack of suitable donors in the group), then one or more of the selected variable criteria (starting with the least important variable) are dropped in order to find a donor.

Note that for all questions, industry type and region were used at least initially when forming donor groups.

Once the donor groups were formed, recipients were often matched to donors within the groups using one of the following matching fields (again depending on what required imputation):

- energy intensity
- total gross floor area
- number of computers, number of full-time equivalent employees, people for maximum capacity, full-time equivalent students attending or beds
- percentage of the air conditioned floor area

If a donor could not be found within three passes for the source of energy used for water heating or space cooling, then the main source was imputed using the energy type that had the highest consumption.

No imputation was done to the mandatory questions. If one of these questions was left blank, then these units were considered non-respondents. As well, no imputation was done for co-generation question since the intent of the question was not to determine the overall percentage of those who have a co-generation system, but rather to identify individual users who have this system.

Estimation

Design weight

The weighting was done using the standard Horvitz-Thompson weights for stratified simple random sampling. Under this approach, the design weight for unit *i* (in stratum *h*) is given by

$$w_{hi} = \frac{N_h}{n_h}$$

where N_h is the population size for stratum *h* and n_h is the sample size for stratum *h*.

Adjustment for total non response

Wherever possible, re-weighting was done at the strata level (industry, region, size grouping) to account for total non-response. In cases where

insufficient responses were available within a stratum, the stratum was combined with a similar stratum for the non-response adjustment. For the re-weighting process, the weights for the responding, out-of-scope and out-of-business units were increased to account for the non-responding units so that the sum of the weights for these three categories (excluding non-responding units) equalled the population total. Thus, the non-response adjustment for unit *i* in non-response group *g* is given by

$$w_{2i} = \frac{N_g}{\sum_{i \in s_r} w_{1i}}$$

where the set s_r includes all responding, out-of-scope and out-of-business units in the sample.

Estimate quality indicators

Coefficients of variation, which indicate the reliability of data, are used to determine which estimates may be published. Estimates with a coefficient of variation exceeding 40% are deemed too unreliable to be published. Moreover, it is important to note that coefficients of variation do not take into account that some data were imputed. Table 5 shows the various indicators used to assess estimate quality.

Table 5. Quality indicators associated with the coefficients of variation

Coefficient of variation	Quality indicator	Quality of estimate
20% or less	A	Very good
From 21 to 30%	B	Acceptable
From 31 to 40%	C	Use with caution
More than 40%	F	Too unreliable to be published

A quality indicator of “F” is also used where data have been suppressed for reasons of confidentiality.

■ APPENDIX C — GLOSSARY

Automated teller machine:

A computerized telecommunications device that provides the clients of a financial institution with access to financial transactions in a public space without the need for a cashier, human clerk or bank teller.

Auxiliary equipment:

Stand-alone equipment powered directly from an electrical outlet such as computers, photocopiers, refrigerators and desktop lamps. It also includes equipment that can be powered by natural gas, propane or other fuels, such as clothes dryers and cooking appliances. See Section 7 for the types of auxiliary equipment covered by CICES 2008.

Building:

A structure totally enclosed by walls extending from the foundation to the roof.

Census:

Collection of information from all units of the population.

Co-generation:

The simultaneous generation of electricity and useful thermal energy (e.g. steam) in one process and from the same fuel source. Types of co-generation units/systems include condensing steam turbines, combined cycle gas turbines, etc.

Computer:

For the purpose of CICES 2008 the definition of a computer includes other electronic devices with a micro-processor (e.g. cash register) and excludes battery-operated and handheld devices.

Computer server:

A computer system that provides essential services over a computer network. This excludes personal computers and laptops.

Diesel:

All grades of low-sulphur (lower than 0.05%) distillate fuel used as an energy source for diesel engines. For the purpose of CICES 2008 diesel does not include diesel used for transportation.

Domestic appliances:

Appliances that are typically found in a residential setting (e.g. stoves, microwave ovens, refrigerators, freezers and dishwashers).

Electricity:

A form of energy emanating from electric charges at rest or in movement. For the purpose of CICES 2008 electricity includes purchased electricity and self-generated electricity kept for on-site usage.

Electricity generation:

The production of electricity in an establishment using a generator, solar panels, fuel cells, aerogenerators, etc.

Energy consumption:

For CICES 2008, the sum of establishment electricity (purchased), natural gas, light fuel oil and other middle distillates, propane, diesel, heavy fuel oil, wood and wood by-products, steam (purchased) and other fuels (as specified by respondent) consumption in terms of energy (gigajoules) during 2008. Establishment energy consumption only accounts for energy consumed at the building level or physical location of the establishment and excludes energy consumed for transportation.

Energy-efficient lighting system:

The use of an energy-efficient ballast which requires a lower power input than a conventional ballast to operate fluorescent and high-intensity discharge lamps. Also included are compact fluorescent light bulbs (CFL), LED lights, up-lighting, timers and motion detectors.

Energy intensity:

CICES 2008 measures the energy intensity as the total amount of energy used by a group of establishments, divided by the total floor area of the same group.

Energy source(s):

Type(s) of energy used by an establishment. For CICES 2008, energy sources include electricity, natural gas, light fuel oil and other middle distillates, propane, diesel, heavy fuel oil, wood and wood by-products, steam, renewable and other fuels (as specified by respondent).

Establishment:

Establishment is the statistical unit used for survey purposes. In the case of colleges and universities, the establishment is the campus. In the case of hospitals, it is the entire set of facilities of the hospital complex. For all other activity sectors, it is the enterprise or institution. An establishment may include more than one building (e.g. a university campus). Conversely, a building may house more than one establishment (e.g. a shopping centre).

Floor area:

Total gross floor area is all the area enclosed above or below ground by the exterior walls of a building, including hallways, lobbies, stairways, penthouses and elevator shafts, but excluding indoor parking and mechanical areas.

Full-time equivalent employee:

A full-time employee is a person who works at an establishment for 30 or more hours a week. This employee is considered to be one full-time equivalent employee. Part-time employees are converted to full-time equivalent employees by taking the total hours per week worked by the part-time employees and dividing by the typical hours per week worked by a full-time employee of the establishment. This definition includes contract workers and volunteers.

Gigajoule (GJ):

A unit of measure for energy consumption equal to 1 billion joules.

Heat recovery system:

A heating, ventilation, and air-conditioning (HVAC) conservation feature that recovers heat from exhaust air.

Heavy fuel oil:

All grades of residual type fuels, including low-sulphur fuels, used mainly as an energy source for steam and electric power generation and diesel motors. The term includes fuel oil grade numbers 4, 5 and 6.

High-efficiency boiler:

A type of space-heating equipment used to generate hot water or steam, with energy efficiencies of 90 to 96%.

Operating hours:

For CICES 2008, normal operating hours are considered to be the hours an establishment is operating during a typical week. This excludes any time period in which maintenance, house-keeping, or security staff are working outside of the normal operating hours. If the hours vary for different parts of the building or complex, respondents report for the area which is open the longest.

HVAC:

Heating, ventilation, and air conditioning.

Industrial food preparation appliances:

Appliances that are typically found in a cafeteria or restaurant such as industrial stoves, ovens, refrigerators, freezers and dishwashers.

Insulation:

Material that reduces unwanted heat loss or gain and can decrease the energy demands of heating and cooling systems.

Light fuel oil and other middle distillates:

A category of energy sources that includes home fuel, light fuel oil (numbers 1, 2 and 3), kerosene, mineral lamp oil, gas oils and light industrial fuel.

Medical diagnosis or treatment machines:

Machines typically found in Health Care establishments. For CICES 2008, the definition includes, but is not limited to, X-ray, CAT scan, MRI, dialysis, and ultrasound machines.

Laundry washers and dryers:

Appliances used to wash and dry clothing.

Natural gas:

An energy source that is a mixture of hydrocarbons (principally methane) and small quantities of various hydrocarbons existing in the gaseous phase or in solution with crude oil in underground reservoirs. It is delivered directly to buildings by pipelines.

North American Industrial Classification System (NAICS):

A classification system that categorizes establishments into groups with similar economic activities. The structure of NAICS, adopted by Statistics Canada in 1997 to replace the 1980 Standard Industrial Classification (SIC), was developed by the statistical agencies of Canada, Mexico and the United States.

Outdoor-air economizer:

An HVAC conservation feature that uses outside air for air conditioning.

Printers, photocopiers and/or fax machines:

Equipment used to print, copy, and/or transmit a visual rendering either from a computer to a piece of paper or from a piece of paper onto another piece of paper.

Programmable thermostat:

A thermostat which is designed to adjust the temperature according to a series of programmed settings that take effect at different times of the day.

Propane:

An energy source that is normally a gaseous straight-chain hydrocarbon (C₃H₈) extracted from natural gas or refinery gas streams. It can also take a liquid form.

Renewable energy source:

An energy source which comes from natural resources such as sunlight, wind, rain, tides, and geothermal heat, which are renewable (naturally replenished).

Solar electricity:

Electricity created by using photovoltaic (PV) technology by converting solar energy into electricity from sunlight.

Solar hot water heater:

Heating systems that are composed of solar thermal collectors and are used to heat domestic hot water and swimming pool water, or for space heating.

Space cooling:

As an energy end-use, conditioning of room air for human comfort by a refrigeration unit (e.g. air conditioner or heat pump) or by the circulation of chilled water through a central- or district-cooling system. The use of fans or venting only, without air or water cooling, is excluded.

Space heating:

As an energy end-use, the use of mechanical equipment to heat all or part of a building. Includes the principal space heating unit and any supplementary equipment.

Steam:

An energy source that is a gas resulting from the vaporization of a liquid or the sublimation of a solid, generated by condensing or non-condensing turbines.

Sterilizing equipment:

Equipment used to sanitize medical instruments or other devices.

Survey:

Collection of information from some (a sample) units of the population. CICES 2008 was a survey of establishments in the C&I sector. Results from this survey were used to produce representative data estimates for all establishments in the C&I sector. These estimates are presented in this report.

Useful thermal energy:

Includes high-pressure steam (greater than 30 psi), low-pressure steam (less than 30 psi), high-temperature water (greater than 80°C), and low-temperature water (less than 80°C). Useful thermal energy can be used for heating or cooling.

Variable air-volume system:

A HVAC conservation feature that supplies varying quantities of conditioned (heated or cooled) air to different parts of a building according to the heating and cooling needs of those specific areas.

Vending machine:

A self-contained device that dispenses a product when the user makes a product selection, often after the deposit of legal tender.

Water heating:

As an energy end-use, the use of energy to heat water for purposes other than space heating.

Wind-powered electric generator:

Electricity generated by converting the rotation of turbine blades into electrical current by means of an electrical generator.

Window enhancements:

Improvements over standard windows, such as reflective shading (whereby a special metallic film has been applied to glass to block and reduce harmful aspects of the sun) and low-E coat (a thin, invisible metallic layer applied directly to glazing surfaces of windows to retain heat in the winter and keep out radiated heat in the summer).

Wood and wood by-products:

An energy source that includes round wood (sold by the cord), lignin, wood scraps (chips) from furniture and window frame manufacturing, bark, sawdust, forestry residues, charcoal and pulp waste.

Year of construction:

For CICES 2008, the year in which the major portion of an establishment's building(s) was (were) built. If two or more portions/buildings of equal size were constructed at different times, then the oldest was reported.

■ APPENDIX D — QUESTIONNAIRE

Background

CICES 2008 used multiple questionnaires to collect data on the C&I sector. All of the questionnaires covered the same core content with only slight variations between versions. The core content was deemed to be questions that were common to all C&I sector establishments. The variations were necessary to cover some activity-specific content. For example, Health Care institutions were asked for the bed occupancy of their institution. While this question makes sense to ask, for example, a hospital, it would not make sense to ask a business. It was therefore necessary to have multiple versions of the CICES 2008 questionnaire, each of which covered the same core content, but had a few slight activity-based content differences.

There were four different versions of the CICES 2008 questionnaire:

- Health Care questionnaire
- Religious Organizations questionnaire
- Education questionnaire
- Business questionnaire

The version that a respondent received was based on their establishment's activity grouping. Obviously establishments in the Health Care, Religious Organizations and Education activity groupings each received the applicable questionnaire. While all other establishments not covered by these activity groupings received what is referred to as the Business questionnaire.

Please see the "coverage" comment indicated below every CICES 2008 question to see which questionnaire contained a specific question.

2008 Commercial and Institutional Consumption of Energy Survey – Questionnaire

- 1a. Please check the physical description that best describes your business as of December 2008.**
- a) Your business is the only one in a stand alone building?
 - b) Your business occupies more than one building?
 - a. Number of buildings?
 - c) Your business is within a building that has other establishments, specifically:
 - a. a mall?
 - b. a strip mall?
 - c. an office tower?
 - d. hospital, university or college, or other large complex?
 - d) Your business is part of another configuration? (please specify)

Coverage: Respondents of the business questionnaire

1b. Please check the physical description that best describes this institution as of December 2008.

- a) This institution is the only one in a stand alone building?
- (e.g. a hospital comprised of only one building)
 - (e.g. this school, college or university is comprised of only one building)
- b) This institution occupies more than one building?
- (e.g. a hospital complex that comprises more than one building)
 - (e.g. a university, college or large school campus that comprises more than one building)
- a. Number of buildings?
- c) This institution is part of another configuration? (please specify)

Coverage: Respondents of the health care and education questionnaires

1c. Please check the physical description that best describes this religious organization as of December 2008.

- a) This religious organization is the only one in a stand alone building?
- b) This religious organization occupies more than one building?
- a. Number of buildings?
- c) This religious organization is within a building that has other establishments, or operates out of a non traditional building, specifically:
- a. a school?
- b. a hospital, university or college, or other large complex?
- c. town hall or other public gathering place?

- d) This religious organization is part of another configuration? (please specify)

Coverage: Respondents of the religious organizations questionnaire

2. What percentage of floor space does your business/religious organization occupy?

- If you don't know the exact percentage, please provide your best estimate.

Coverage: Respondents of the business and religious organizations questionnaires

3. As of December 2008, what was the total gross floor area of your business/institution/religious organization, and indicate the unit of measure (square feet or square metres).

- Exclude indoor parking, mechanical areas, and areas occupied by other businesses/institutions.
 - If you don't know the exact area, please provide your best estimate.
 - All remaining questions on energy use will refer to the area you report here.
- a) Total gross floor area?

Coverage: All respondents

4. Please indicate the total number of months your business/institution/religious organization was open in 2008.

- a) Number of months?

Coverage: All respondents

5. Please indicate the total number of normal operating hours for your business/institution/religious organization during a typical week.

- Please exclude any time when maintenance, house-keeping, or security staff are working outside of the normal operating hours. If the hours vary for different parts of the building or complex, report for that area which is open the longest.

a) Number of hours?

Coverage: All respondents

6a. As of December 2008, what was the total number of full-time equivalent employees?

- Include contract workers and volunteers.
- Full-time work is considered to be 30 hours or more per week.
- Please convert part-time employees to full-time equivalent. For example, two part-time workers who each work 20 hours a week can be considered on full-time equivalent.
- If you don't know the exact number, please provide your best estimate.

a) Number of full-time equivalent employees?

Coverage: Respondents of the business questionnaire

6b. As of December 2008, what was the total number of beds in this institution?

Coverage: Respondents of the health care questionnaire

6c. As of December 2008, what was the maximum capacity of people allowed in the space or building(s) used by this religious organization?

Coverage: Respondents of the religious organizations questionnaire

6d. As of December 2008, what was the total number of full-time equivalent students attending this institution?

Coverage: Respondents of the education questionnaire

7. For each of the following types of equipment, please indicate the number of pieces that were in use on site as of December 2008.

- If you don't know the exact number, please provide your best estimate.

Equipment	Number of pieces of equipment
Computers (including other electronic devices with a micro-processor (e.g. cash registers, etc.); exclude battery-operated and hand held devices.)	
Printers, photocopiers and/or fax machines	
Computer servers (such as server farm (networked servers in one location), mainframe)	
Domestic appliances (e.g. stoves, microwave ovens, refrigerators, freezers and dishwashers)	
Industrial food preparation appliances (e.g. industrial stoves, ovens, refrigerators, freezers and dishwashers found in a cafeteria or restaurant)	
Laundry washers and dryers	
Sterilizing equipment	
Medical diagnosis or treatment machines (e.g. X-ray, CAT scan, MRI, dialysis, ultrasound)	
Vending machines	
Automated teller machine (ATMs or bank machines)	

Coverage: All respondents

- 8. For the 2008 calendar year, who paid the energy bills for the energy consumed by your business/institution/religious organization?**
- a) Your business/institution/religious organization paid the energy provider(s) directly for all energy bills.
 - b) Your business/institution/religious organization paid for some bills directly and the landlord or property manager paid for some.
 - c) The landlord or property manager paid the energy provider(s) directly for all energy consumption.
 - d) Other arrangement (please specify).

Coverage: All respondents

- 9. In which year was construction completed for the largest portion of the building(s) occupied by your business/institution/religious organization?**
- If the exact year is unknown, please provide your best estimate.
 - If two or more portions/buildings of equal size were constructed at different times, then choose the oldest.
- a) Specific year
 - b) Before 1920
 - c) 1920–1959
 - d) 1960–1969
 - e) 1970–1979
 - f) 1980–1989
 - g) 1990–1999
 - h) 2000–2004
 - i) 2005 or later
 - j) Don't know

Coverage: All respondents

- 10. Please indicate whether any of the following energy consumption features were present in your business/institution/religious organization as of December 2008 (with respect to the area reported in question 3).**

Energy Conservation Features	Yes	No	Don't Know
Energy-efficient lighting system			
Programmable thermostat			
Heating equipment			
High-efficiency boiler			
Heat recovery system			
Ventilation and air-conditioning equipment			
Variable air-volume system			
Outdoor-air economizer			
Renewable energy features			
Solar electricity			
Solar hot water heater			
Wind powered electric generator			
Improvements to building			
Window enhancements (e.g. low-e coatings, shading films, inert gas-fill, awnings, etc.)			
Basement insulation			
Roof insulation			
Wall insulation			
Other (please specify)			

Coverage: All respondents

11. For the 2008 calendar year, please indicate the total quantity consumed, the unit of measure, and the total amount spent for each form of energy consumed by your business/institution/religious organization.

- Please indicate only the energy consumed at the building level or physical location of your business/institution/religious organization, relating to the floor space reported in question 3.
- Do not include fuel or energy used for transportation.
- For amount spent, please report in Canadian dollars the total including taxes, service charges and any rebates.
- If exact figures are not available, please provide your best estimate.



Energy Form	Quantity Consumed	Energy Unit or Measure (please check one)	Amount Spent Cdn \$ (omit cents)
Electricity purchased (please exclude electricity generated by your establishment)		<input type="checkbox"/> kWh <input type="checkbox"/> MWh <input type="checkbox"/> GJ <input type="checkbox"/> other (please specify)	
Natural gas		<input type="checkbox"/> m ³ <input type="checkbox"/> L <input type="checkbox"/> ft ³ <input type="checkbox"/> GJ <input type="checkbox"/> other (please specify)	
Light fuel oil and other middle distillates such as kerosene, etc.		<input type="checkbox"/> m ³ <input type="checkbox"/> L <input type="checkbox"/> ft ³ <input type="checkbox"/> GJ <input type="checkbox"/> other (please specify)	
Propane		<input type="checkbox"/> m ³ <input type="checkbox"/> L <input type="checkbox"/> ft ³ <input type="checkbox"/> GJ <input type="checkbox"/> other (please specify)	
Diesel		<input type="checkbox"/> m ³ <input type="checkbox"/> L <input type="checkbox"/> ft ³ <input type="checkbox"/> GJ <input type="checkbox"/> other (please specify)	
Heavy fuel oil (a low-grade, tar-like fuel used in industrial boilers, blast furnaces, etc.)		<input type="checkbox"/> m ³ <input type="checkbox"/> L <input type="checkbox"/> ft ³ <input type="checkbox"/> GJ <input type="checkbox"/> other (please specify)	
Wood and wood by-products (e.g. hog fuel, wastewood, bark, pellets, etc.)		<input type="checkbox"/> tonnes (metric) <input type="checkbox"/> lbs (pounds) cords <input type="checkbox"/> other (please specify)	
Steam purchased (please exclude steam generated by your establishment.)		<input type="checkbox"/> kWh <input type="checkbox"/> MWh <input type="checkbox"/> GJ <input type="checkbox"/> other (please specify)	
Please specify steam supplier below			
Other (please specify type) Type:		Unit (please specify)	

Coverage: All respondents

12. For the 2008 calendar year, please indicate the main source of energy used to heat the building space reported in question 3, as well as any alternate sources used.

Energy Source	Main Energy Source for Space Heating (mark one only)	Alternate Energy Sources for Space Heating (mark all that apply)
Electricity		
Natural gas		
Light fuel oil and other middle distillates such as kerosene, etc.		
Propane		
Diesel		
Heavy fuel oil (a low-grade, tar-like fuel used in industrial boilers, blast furnaces, etc.)		
Wood and wood by-products (e.g. hog fuel, wastewood, bark, pellets, etc.)		
Steam		
Other (please specify)		
Not applicable (no heating)		
Don't know		

Coverage: All respondents

13. For the 2008 calendar year, please indicate the main source of energy used for domestic water heating (i.e. water used for consumption, not for space heating).

Energy Source	Main Energy Source for Water Heating (mark one only)
Electricity	
Natural gas	
Light fuel oil and other middle distillates such as kerosene, etc.	
Propane	
Diesel	
Heavy fuel oil (a low-grade, tar-like fuel used in industrial boilers, blast furnaces, etc.)	
Wood and wood by-products (e.g. hog fuel, wastewood, bark, pellets, etc.)	
Steam	
Renewable (e.g. solar)	
Other (please specify)	
Not applicable (no water heating)	
Don't know	

Coverage: All respondents

14. For the 2008 calendar year, what percentage of the total floor area reported in question 3 was air conditioned?

- Include central air conditioners and stand-alone units.
- If you don't know the exact percentage, please provide your best estimate.
- _____ % of total floor area.

Coverage: All respondents

15. For the 2008 calendar year, please indicate the main source of energy used for space cooling, as well as any alternate forms used.

Energy Source	Main Energy Source for Space Cooling (mark one only)	Alternate Energy Sources for Space Cooling (mark all that apply)
Electricity		
Natural gas		
Light fuel oil and other middle distillates such as kerosene, etc.		
Propane		
Diesel		
Heavy fuel oil (a low-grade, tar-like fuel used in industrial boilers, blast furnaces, etc.)		
Wood and wood by-products (e.g. hog fuel, wastewood, bark, pellets, etc.)		
Steam		
Other (please specify)		
Not applicable (no heating)		
Don't know		

Coverage: All respondents

16. Does your business/institution/religious organization have a co-generation unit / system?

- Co-generation is defined as the simultaneous generation of electricity and useful thermal energy (e.g. steam) in one process and from the same fuel source. Types of co-generation units/systems include condensing steam turbines, combined cycle gas turbines, etc.
- a) Yes?
 - b) No?
 - c) Don't know?

Coverage: All respondents

■ APPENDIX E — BACKGROUND DATA

Canadian Regional Population

SOURCE: Statistics Canada Quarterly population estimates, national perspective – Population Catalogue no. 91-002-X

Region	Population	Percentage (%)
Canada	33 820 999	100%
Atlantic	2 343 439	7%
Quebec	7 870 026	23%
Ontario	13 134 455	39%
Prairies	5 978 847	18%
British Columbia	4 494 232	13%



¹⁹ For the purpose of this report, the Canadian population data excludes the Territories. This was necessary in order to have comparable data between the population and the CICES 2008 sample, which, too, excluded the Territories.

■ APPENDIX F — SUMMARY OF 2007 COMMERCIAL & INSTITUTIONAL CONSUMPTION OF ENERGY SURVEY

Cautionary Note

As mentioned in this report's foreword, CICES has evolved from a survey in 2003 of only universities, colleges and hospitals to a survey in 2008 covering nearly all segments of the C&I sector. Consequently, each iteration of CICES has seen some methodological changes, which were all adopted in an effort to improve the CICES data estimates of the Canadian C&I sector. Some of the methodological changes include increased C&I sector coverage, refinement of establishment sampling methodology and questionnaire modifications to minimize non-response.

Additionally, CICES is not designed to be a longitudinal study where the same respondents, i.e. establishments, are surveyed for each survey

iteration. While such a design would enable a perfect trend analysis of the same establishments over time, it would not enable a trend analysis of the entire C&I sector as it would fail to capture changes in the composition of all C&I establishments over time. For this reason, each CICES has been designed as a cross sectional survey that examines the C&I sector in a defined time period.

As a result of the methodological changes and the cross sectional survey design, trend comparisons between data estimates for each iteration of CICES are not advisable.

CICES 2007

The general characteristics of the C&I sector as observed by CICES 2007 are presented below.

Table 1. Summary of CICES 2007 results										
Activity Grouping	Number of Establishments		Energy Consumption (GJ)		Floor Area (m²)		Average Floor Area per Establishment (m²)		Energy Intensity (GJ/m²)	
Wholesale and Warehousing	36 210	A	77 461 996	A	77 487 717	A	2 140	A	1.00	A
Retail Trade	103 163	A	138 837 328	A	106 044 972	A	1 028	A	1.31	A
• Non-food retail	83 183	A	108 893 707	A	90 340 676	A	1 086	A	1.21	A
• Food retail	19 980	A	29 943 622	A	15 704 297	C	786	C	1.91	C
Information and Cultural	7 118	A	35 167 777	B	21 436 390	B	3 012	B	1.64	A
Financial, Real Estate and Other Professional Services	67 562	A	113 160 929	C	74 527 114	B	1 103	B	1.52	C
Public Administration	6 722	A		F		F		F	1.89	A
Education	21 765	A	204 788 032	A	142 110 227	A	6 529	A	1.44	A
• Elementary and secondary schools	15 611	A	65 959 961	A	71 336 872	A	4 570	A	0.92	A
• Community colleges and CEGEPs	1 808	A		F	37 507 985	B	20 743	B	2.02	C
• Universities	268	A	59 917 843	A	30 543 012	A	113 850	A	1.96	A
• Business Schools and Others	4 077	A	3 043 109	B	2 722 357	B	668	B	1.12	A
Health Care	49 309	A	105 300 419	A	60 284 431	A	1 223	A	1.75	A
• Ambulatory health care services	32 867	A		F	13 677 936	C	416	C		F
• Hospitals	717	A	53 737 553	A	19 369 718	A	26 999	A	2.77	A
• Nursing and residential care facilities	5 704	A	27 919 625	C	18 196 759	B	3 190	B	1.53	A
• Social assistance	10 021	A	10 807 422	B	9 040 019	A	902	A	1.20	A
Accommodation Services	8 254	A	44 893 885	A	31 407 594	A	3 805	A	1.43	A
Food Services and Drinking Places	49 047	A	56 658 113	A	14 510 653	A	296	A	3.90	A
Religious Organizations	28 030	A	33 966 392	A	37 645 690	A	1 343	A	0.90	A
Other Services¹	66 330	A	92 927 534	A	66 133 566	A	997	A	1.41	A
Canadian C&I Sector	443 510	A	962 958 618	A	663 296 953	A	1 496	A	1.45	A

The letter to the right of each estimate indicates its quality, as follows: A – Very good, B – Acceptable, C – Use with caution, F – Too unreliable to be published or suppressed for reasons of confidentiality.

Due to rounding, numbers may not add up to the total shown, and some numbers may differ slightly from one table to the next.

¹ The residual category “Other Services” includes the categories *Arts, Entertainment and Recreation* (NAICS 71) and *Other services except religious organizations* (NAICS 81, except 813110).