

Appendix D

Relative Standard Errors

Table D1. Relative Standard Errors for Estimates of District Heat Consumption by CBECS Survey Year, for Buildings Constructed Before 1980 (Percent)

CBECS Survey Year	Floorspace Served by District Heat	District Heat Consumption	Consumption per Square Foot
1979	19.6	15.6	7.7
1983	18.1	26.4	15.5
1986	15.8	23.6	16.0
1989	23.1	22.8	15.2

Note: The 1979 and 1983 CBECS asked for purchased steam; the 1986 CBECS asked for purchased and nonpurchased steam and hot water; the 1989 CBECS asked for district steam or district hot water piped into the building.

Source: Energy Information Administration, Office of Energy Markets and End Use, 1979, 1983, 1986 and 1989 Commercial Buildings Energy Consumption Surveys.

Table D2. Relative Standard Errors for Principal Activity of Multibuilding Facility and Principal Activity of Commercial Buildings, Number of Buildings and Floorspace (Percent)

Commercial Building Characteristics	All Buildings on Facilities	Principal Facility Activity				
		College and University	Other School	Office	Shopping Center and Mall	Hospital
Buildings						
All Buildings on Facilities	3.7	16.8	10.8	12.3	11.4	17.7
Principal Building Activity						
Assembly	9.5	32.0	20.1	43.6	54.4	68.2
Education	11.6	24.5	12.4	100.0	NC	51.7
Food Sales and Service	16.4	51.6	29.7	NC	38.8	NC
Health Care	21.4	48.6	NC	43.8	NC	18.5
Lodging	10.2	19.6	53.9	75.4	84.6	53.6
Mercantile and Service	9.0	38.9	94.1	36.3	12.5	73.2
Office	9.2	40.6	42.8	14.1	57.1	26.2
Parking Garage	24.3	57.5	64.4	43.5	92.7	50.9
Warehouse	8.7	75.5	77.9	49.8	41.1	43.4
Other	27.1	43.5	0.3	45.4	NC	96.5
Vacant	14.5	67.2	76.4	22.3	49.6	87.2
Ownership and Occupancy						
Nongovernment Owned						
Owner Occupied	5.7	25.1	21.0	14.1	16.4	21.5
Nonowner Occupied	11.3	49.5	74.1	18.5	15.4	44.8
Government Owned	7.7	20.4	12.1	25.5	3.2	30.0
Floorspace						
All Buildings on Facilities	5.4	21.9	10.7	18.0	13.8	20.0
Principal Building Activity						
Assembly	13.8	38.6	22.5	54.6	60.8	80.0
Education	10.3	33.1	11.2	100.0	NC	54.1
Food Sales and Service	17.3	50.5	23.4	NC	37.3	NC
Health Care	21.2	54.3	NC	49.2	NC	22.5
Lodging	12.2	18.4	73.1	70.8	70.9	34.5
Mercantile and Service	11.7	43.3	83.4	34.9	16.0	73.0
Office	13.2	39.5	39.2	21.4	55.2	23.4
Parking Garage	23.2	51.8	63.8	38.1	71.4	56.8
Warehouse	11.8	67.8	68.3	52.2	47.5	30.8
Other	23.2	52.0	0.3	41.6	NC	98.1
Vacant	26.2	59.0	82.9	19.0	43.5	63.9
Ownership and Occupancy						
Nongovernment Owned						
Owner Occupied	6.0	24.0	26.7	13.2	21.8	28.7
Nonowner Occupied	12.1	44.9	70.7	19.3	16.0	57.2
Government Owned	9.3	26.3	11.2	40.0	3.2	20.2

See footnotes at end of table.

Table D2. Relative Standard Errors for Principal Activity of Multibuilding Facility and Principal Activity of Commercial Buildings, Number of Buildings and Floorspace (Continued)
(Percent)

Commercial Building Characteristics	Principal Facility Activity					
	Industrial	Hotel and Motel	Entertainment Complex	Warehouse	Religious	Other
Buildings						
All Buildings on Facilities	17.6	16.5	17.2	11.4	14.4	12.5
Principal Building Activity						
Assembly	89.9	99.0	17.7	1.9	18.0	42.9
Education	82.4	NC	NC	0.0	34.8	NC
Food Sales and Service	99.1	54.8	48.8	98.4	70.6	58.4
Health Care	NC	NC	NC	NC	NC	0.3
Lodging	NC	16.6	96.6	NC	78.9	70.3
Mercantile and Service	41.6	99.2	34.6	32.4	NC	17.8
Office	19.8	88.7	54.0	33.5	62.7	37.8
Parking Garage	87.2	NC	70.7	62.2	2.1	64.1
Warehouse	31.0	100.3	37.6	11.4	NC	25.5
Other	39.9	NC	8.2	98.7	NC	40.1
Vacant	33.2	100.3	74.7	29.8	63.3	39.2
Ownership and Occupancy						
Nongovernment Owned						
Owner Occupied	18.4	18.8	22.6	14.2	14.7	14.8
Nonowner Occupied	32.1	47.0	58.0	19.6	55.0	38.2
Government Owned	34.9	NC	21.6	51.4	NC	24.0
Floorspace						
All Buildings on Facilities	16.5	13.7	16.8	15.0	16.6	17.6
Principal Building Activity						
Assembly	76.1	91.1	16.3	1.9	19.3	46.9
Education	75.3	NC	NC	NC	36.6	NC
Food Sales and Service	98.2	60.9	43.7	98.4	72.2	64.6
Health Care	NC	NC	NC	NC	NC	0.3
Lodging	NC	13.6	96.6	NC	73.9	71.5
Mercantile and Service	48.4	99.2	36.5	29.8	NC	21.5
Office	25.0	62.1	63.9	35.7	63.5	35.9
Parking Garage	75.1	NC	57.5	70.6	2.1	65.0
Warehouse	27.1	100.3	44.4	16	NC	32.3
Other	38.5	NC	8.2	98.7	NC	30.5
Vacant	29.1	100.3	80.7	57.2	68.3	47.0
Ownership and Occupancy						
Nongovernment Owned						
Owner Occupied	17.0	15.7	24.6	18.9	16.8	14.4
Nonowner Occupied	25.6	44.1	60.5	22.6	57.8	40.5
Government Owned	35.5	NC	27.9	49.2	NC	29.8

NC = No cases in sample.

Source: Energy Information Administration, Office of Energy Markets and End Use, Forms EIA-871A, "Building Questionnaire," and EIA-871B, "Facility Form" of the 1989 Commercial Buildings Energy Consumption Survey.

Table D3. Relative Standard Errors for Census Region of Commercial Buildings on Multibuilding Facilities, Number of Buildings and Floorspace (Percent)

Commercial Building Characteristics	All Buildings on Facilities	Census Region			
		Northeast	Midwest	South	West
Buildings					
All Buildings on Facilities	3.7	9.9	11.2	7.6	6.0
Principal Facility Activity					
College and University	16.8	17.6	34.3	17.1	35.1
Other School	10.8	40.7	26.0	18.5	14.2
Office	12.3	26.9	30.9	20.7	12.7
Shopping Center and Mall	11.4	16.0	25.3	22.1	30.0
Hospital	17.7	35.7	30.5	42.8	35.9
Industrial	17.6	29.5	18.1	30.1	36.9
Hotel and Motel	16.5	41.6	57.1	29.7	25.5
Entertainment Complex	17.2	32.8	35.5	27.9	40.7
Warehouse	11.4	29.7	18.6	21.5	29.2
Religious	14.4	19.1	32.8	22.9	34.1
Other	12.5	29.7	21.0	21.6	34.8
Floorspace					
All Buildings on Facilities	5.4	14.6	12.0	10.4	10.3
Principal Facility Activity					
College and University	21.9	29.3	28.6	29.3	47.5
Other School	10.7	27.7	15.8	19.2	18.8
Office	18.0	31.2	31.1	31.9	19.3
Shopping Center and Mall	13.8	52.8	22.2	17.2	28.9
Hospital	20.0	30.2	43.0	22.5	33.7
Industrial	16.5	22.9	33.7	27.5	37.4
Hotel and Motel	13.7	47.8	65.5	27.8	17.5
Entertainment Complex	16.8	31.1	35.4	37.4	19.5
Warehouse	15.0	41.3	22.1	25.0	29.0
Religious	16.6	23.9	29.0	27.6	34.1
Other	17.6	41.4	16.9	28.6	37.8

Source: Energy Information Administration, Office of Energy Markets and End Use, Forms EIA-871A, "Building Questionnaire," and EIA-871B, "Facility Form" of the 1989 Commercial Buildings Energy Consumption Survey.

Table D4. Relative Standard Errors for Commercial Buildings by Presence of a Central Physical Plant on Multibuilding Facilities, Number of Buildings and Floorspace (Percent)

Commercial Building Characteristics	All Buildings on Facilities	with Central Plant on Facility	Without Central Plant on Facility
Buildings			
All Buildings on Facilities	3.7	10.9	3.8
Principal Facility Activity			
College and University	16.8	22.3	21.5
Other School	10.8	25.9	11.1
Office	12.3	34.6	13.2
Shopping Center and Mall	11.4	36.9	11.4
Hospital	17.7	18.8	37.2
Industrial	17.6	25.0	22.3
Hotel and Motel	16.5	48.3	18.4
Entertainment Complex	17.2	91.3	17.3
Warehouse	11.4	NC	11.4
Religious	14.4	59.7	14.6
Other	12.5	42.4	12.3
Floorspace			
All Buildings on Facilities	5.4	13.0	6.3
Principal Facility Activity			
College and University	21.9	26.6	20.4
Other School	10.7	24.9	10.6
Office	18.0	24.3	20.4
Shopping Center and Mall	13.8	47.0	13.7
Hospital	20.0	26.6	29.0
Industrial	16.5	19.1	22.4
Hotel and Motel	13.7	47.3	14.7
Entertainment Complex	16.8	87.0	20.9
Warehouse	15.0	NC	15.0
Religious	16.6	54.5	16.7
Other	17.6	36.9	14.3

NC = No cases in sample.

Source: Energy Information Administration, Office of Energy Markets and End Use, Forms EIA-871A, "Building Questionnaire," and EIA-871B, "Facility Form" of the 1989 Commercial Buildings Energy Consumption Survey.

Table D5. Relative Standard Errors for Energy Consumed at Commercial Buildings on Multibuilding Facilities (Percent)

Commercial Building Characteristics	Major Fuels	Electricity	Natural Gas	Fuel Oil	District Heat
All Buildings on Facilities	11.2	11.1	12.7	26.4	24.3
Principal Facility Activity					
College and University	33.4	34.5	51.1	59.4	44.3
Other School	17.1	15.5	19.3	40.1	75.5
Office	12.4	12.6	21.5	62.0	37.7
Shopping Center and Mall	16.0	17.3	21.6	48.9	NC
Hospital	27.0	16.5	28.9	51.1	46.0
Industrial	25.7	29.4	43.9	94.9	40.3
Hotel and Motel	21.0	20.0	26.7	64.0	75.1
Entertainment Complex	22.1	19.0	32.0	27.3	NC
Warehouse	25.5	29.6	33.1	43.8	NC
Religious	15.4	16.5	18.9	35.4	3.0
Other	24.9	36.1	23.1	57.2	75.7
Central Physical Plant					
Present on Facility	19.6	20.8	24.8	43.9	25.3
Not Present on Facility	8.1	9.2	9.0	19.6	39.0

NC = No cases in sample.

Note: "District Heat" includes district steam and district hot water.

Source: Energy Information Administration, Office of Energy Markets and End Use, Forms EIA-871A through EIA-871F of the 1989 Commercial Buildings Energy Consumption Survey.

Table D6. Relative Standard Errors for Number and Floorspace of Multibuilding Facilities with Central Physical Plants (Percent)

Facility Characteristics	Number of Facilities	Facility Floorspace		Floorspace per Facility	Percent Commercial Floorspace
		Total	Commercial		
All Sectors					
All Facilities	19.6	17.6	14.1	19.7	11.9
Census Region					
Northeast	45.6	23.2	22.0	25.9	11.4
Midwest	43.6	24.0	28.1	32.6	15.5
South	30.6	31.4	17.6	30.3	25.9
West	39.7	37.6	32.8	39.5	5.0
Total Floorspace (square feet)					
200,000 or Less	29.8	34.2	24.3	15.5	18.6
200,001 to 500,000	30.3	30.4	20.9	3.9	25.2
500,001 to 1,000,000	28.4	27.3	24.8	4.6	11.2
1,000,001 to 5,000,000	23.2	24.0	21.1	9.3	16.8
Over 5,000,000	42.1	46.8	37.5	17.9	32.6
Commercial Sector					
All Facilities	20.1	17.2	15.6	21.5	2.7
Census Region					
Northeast	30.8	24.0	24.3	29.7	4.5
Midwest	29.6	30.0	30.7	28.9	2.2
South	40.9	20.9	22.1	32.1	4.0
West	24.1	38.4	32.0	36.7	5.7
Principal Facility Activity					
College and University	28.4	31.2	27.3	31.4	4.0
Other School	41.0	26.2	26.4	26.6	5.4
Office	42.4	27.0	27.1	44.1	.5
Hospital	28.2	28.3	29.7	26.1	4.9
Other	35.1	32.2	32.3	27.4	4.7
Total Floorspace (square feet)					
200,000 or Less	36.2	27.5	27.9	15.9	3.8
200,001 to 500,000	28.9	29.3	28.8	5.2	4.2
500,001 to 1,000,000	26.8	25.3	25.8	4.3	4.7
1,000,001 to 5,000,000	25.9	21.9	22.4	7.8	1.8
Over 5,000,000	44.5	43.5	38.4	4.7	7.0

See footnotes at end of table.

**Table D6. Relative Standard Errors for Number and Floorspace of Multibuilding Facilities with Central Physical Plants
(Continued)
(Percent)**

Facility Characteristics	Number of Facilities	Facility Floorspace		Floorspace per Facility	Percent Commercial Floorspace
		Total	Commercial		
Industrial Sector					
All Facilities	30.6	31.0	20.5	30.2	27.1
Census Region					
Northeast	76.4	51.1	29.4	32.4	31.2
Midwest	71.7	42.4	42.0	57.1	30.8
South	41.4	46.0	34.8	38.8	34.5
West	120.0	53.1	60.6	68.4	15.5
Total Floorspace (square feet)					
200,000 or Less	42.2	49.7	48.0	20.5	14.8
200,001 to 500,000	45.8	46.2	36.7	5.3	35.9
500,001 to 1,000,000	125.4	120.5	93.0	10.1	47.8
1,000,001 to 5,000,000	48.4	57.3	42.6	28.9	70.8
Over 5,000,000	71.6	86.6	80.3	41.0	46.8

Note: "All Sectors" estimates include multibuilding residential facilities.

Source: Energy Information Administration, Office of Energy Markets and End Use, Form EIA-871B, "Facility Form" of the 1989 Commercial Buildings Energy Consumption Survey.

**Table D7. Relative Standard Errors for Number of Buildings on Multibuilding Facilities with Central Plants, Number of Facilities
(Percent)**

Facility Characteristics	All Facilities	Number of Buildings on Facility				
		4 or Less	5 to 10	11 to 25	26 to 100	Over 100
All Sectors						
All Facilities	19.6	33.1	39.5	41.5	42.1	38.4
Total Floorspace (square feet)						
200,000 or Less	29.8	42.0	46.7	84.3	122.1	NC
200,001 to 500,000	30.3	38.4	48.8	55.2	65.0	88.5
500,001 to 1,000,000 . . .	28.4	45.5	74.8	52.7	52.6	96.3
1,000,001 to 5,000,000 . .	23.2	91.1	63.1	45.8	29.9	67.0
Over 5,000,000	42.1	110.8	91.7	70.3	133.7	47.7
Commercial Sector						
All Facilities	20.1	38.1	27.7	31.0	25.7	44.3
Principal Facility Activity						
College and University . .	28.4	78.0	86.5	57.1	39.8	51.9
Other School	41.0	59.2	40.4	96.9	76.9	98.3
Office	42.4	56.2	62.0	95.5	81.2	74.4
Hospital	28.2	50.3	63.4	44.7	29.2	72.3
Other	35.1	55.2	64.8	83.9	101.3	94.1
Total Floorspace (square feet)						
200,000 or Less	36.2	48.0	38.9	79.5	155.9	NC
200,001 to 500,000	28.9	52.2	51.6	46.4	143.5	NC
500,001 to 1,000,000 . . .	26.8	45.8	78.4	62.7	48.2	99.2
1,000,001 to 5,000,000 . .	25.9	60.2	70.2	44.0	25.6	67.2
Over 5,000,000	44.5	110.8	100.9	128.4	73.5	50.0
Industrial Sector						
All Facilities	30.6	61.0	53.0	69.4	60.5	70.3
Total Floorspace (square feet)						
200,000 or Less	42.2	80.5	55.3	106.8	128.2	0.0
200,001 to 500,000	45.8	59.1	142.6	97.0	69.5	88.5
500,001 to 1,000,000 . . .	125.4	28.9	177.7	83.6	142.1	146.3
1,000,001 to 5,000,000 . .	48.4	135.9	128.7	102.8	128.5	159.9
Over 5,000,000	71.6	0.0	20.4	70.8	1.0	134.1

NC = No cases in sample.

Note: "All Sectors" estimates include multibuilding residential facilities.

Source: Energy Information Administration, Office of Energy Markets and End Use, Form EIA-871B, "Facility Form" of the 1989 Commercial Buildings Energy Consumption Survey.

Table D8. Relative Standard Errors for Qualifying Facilities and Cogeneration, Number of Multibuilding Facilities (Percent)

Facility Characteristics	Number of Facilities	Qualifying Facilities	Cogeneration System	
			Total	Connected to Grid
All Sectors				
All Facilities	19.6	40.1	50.6	54.5
Total Floorspace (square feet)				
200,000 or Less	29.8	68.6	119.1	129.4
200,001 to 500,000	30.3	61.7	65.5	67.0
500,001 to 1,000,000	28.4	37.3	88.9	91.0
1,000,001 to 5,000,000	23.2	34.3	55.8	77.3
Over 5,000,000	42.1	65.2	37.3	47.9
Commercial Sector				
All Facilities	20.1	52.6	118.0	144.0
Principal Facility Activity				
College and University	28.4	61.8	90.7	103.6
Other School	41.0	96.0	286.4	360.8
Office	42.4	63.1	103.5	110.2
Hospital	28.2	46.7	60.8	66.1
Other	35.1	80.1	129.4	147.7
Total Floorspace (square feet)				
200,000 or Less	36.2	79.9	238.1	319.6
200,001 to 500,000	28.9	62.9	166.3	202.3
500,001 to 1,000,000	26.8	40.9	112.0	111.6
1,000,001 to 5,000,000	25.9	36.4	46.0	47.6
Over 5,000,000	44.5	104.0	42.5	56.4
Industrial Sector				
All Facilities	30.6	56.8	61.1	62.2
Total Floorspace (square feet)				
200,000 or Less	42.2	106.9	155.2	157.5
200,001 to 500,000	45.6	79.6	69.6	70.0
500,001 to 1,000,000	125.4	156.8	131.5	141.8
1,000,001 to 5,000,000	48.4	72.6	189.5	350.7
Over 5,000,000	71.6	67.5	61.3	69.5

Note: "All Sectors" estimates include multibuilding residential facilities.

Source: Energy Information Administration, Office of Energy Markets and End Use, Form EIA-871B, "Facility Form" of the 1989 Commercial Buildings Energy Consumption Survey.

Table D9. Relative Standard Errors for Number of Multibuilding Facilities by Types of Central Physical Plant Energy Outputs (Percent)

Facility Characteristics	Number of Facilities	Types of Energy Outputs			
		Steam	Hot Water	Chilled Water	Electricity
All Sectors					
All Facilities	19.6	23.4	34.2	22.1	39.9
Census Region					
Northeast	45.6	53.4	40.9	31.4	94.4
Midwest	43.6	28.2	69.9	41.4	57.2
South	30.6	34.8	56.5	34.8	52.3
West	39.7	45.7	77.2	55.1	115.0
Energy Outputs					
Steam	23.4	23.4	31.1	32.1	43.5
Hot Water	34.2	31.1	34.2	30.3	112.1
Chilled Water	22.1	32.1	30.3	22.1	67.1
Electricity	39.9	43.5	112.1	67.1	39.9
Energy Inputs					
Fuel Oil	33.3	36.5	42.2	58.3	54.4
Natural Gas	23.4	27.8	32.7	25.4	45.5
Coal	53.3	56.6	109.1	74.1	73.4
Electricity	27.1	34.5	45.5	24.9	51.2
Commercial Sector					
All Facilities	20.1	26.7	35.1	19.1	41.7
Principal Facility Activity					
College and University	28.4	33.5	42.4	29.4	80.6
Other School	41.0	54.6	62.6	47.2	123.3
Office	42.4	42.3	61.7	50.4	66.5
Hospital	28.2	33.6	67.5	44.1	66.7
Other	35.1	44.8	56.3	49.2	96.0
Census Region					
Northeast	30.8	36.3	69.5	43.4	147.0
Midwest	29.6	35.8	55.9	47.6	60.6
South	40.9	53.4	59.6	34.3	60.7
West	24.1	32.0	44.7	36.4	85.6
Energy Outputs					
Steam	26.7	26.7	45.2	27.6	51.1
Hot Water	35.1	45.2	35.1	38.7	87.0
Chilled Water	19.1	27.6	38.7	19.1	51.9
Electricity	41.7	51.1	87.0	51.9	41.7
Energy Inputs					
Fuel Oil	24.0	26.2	45.8	41.1	70.8
Natural Gas	17.9	17.8	38.6	19.8	41.6
Coal	77.8	79.0	115.3	82.4	79.5
Electricity	18.7	24.2	35.9	23.6	44.9

See footnotes at end of table.

Table D9. Relative Standard Errors for Number of Multibuilding Facilities by Types of Central Physical Plant Energy Outputs (Continued)
(Percent)

Facility Characteristics	Number of Facilities	Types of Energy Outputs			
		Steam	Hot Water	Chilled Water	Electricity
Industrial Sector					
All Facilities	30.6	33.6	78.3	97.7	50.9
Census Region					
Northeast	76.4	77.5	108.3	328.0	190.5
Midwest	71.7	62.3	98.5	96.5	83.3
South	41.4	42.9	198.7	122.9	60.3
West	120.0	143.9	166.3	175.0	186.8
Energy Outputs					
Steam	33.6	33.6	83.6	108.7	53.8
Hot Water	78.3	83.6	78.3	81.3	229.2
Chilled Water	97.7	108.7	81.3	97.7	287.8
Electricity	50.9	53.8	229.2	287.8	50.9
Energy Inputs					
Fuel Oil	43.9	44.4	168.1	187.7	61.2
Natural Gas	39.4	41.2	127.3	103.9	73.2
Coal	72.2	81.8	501.9	148.8	76.9
Electricity	44.7	52.5	81.4	98.2	101.6

Note: "All Sectors" estimates include multibuilding residential facilities.

Source: Energy Information Administration, Office of Energy Markets and End Use, Form EIA-871B, "Facility Form" of the 1989 Commercial Buildings Energy Consumption Survey.

Table D10. Relative Standard Errors for Central Physical Plant Energy Output Quantities
(Percent)

Facility Characteristics	Total Outputs	Steam	Hot Water	Chilled Water	Electricity
All Sectors					
All Facilities	36.4	42.9	35.3	38.1	48.9
Census Region					
Northeast	52.9	62.8	63.5	68.1	81.5
Midwest	30.6	30.8	61.2	53.4	42.6
South	51.8	58.0	78.1	68.3	71.5
West	30.7	28.8	59.2	53.1	47.6
Energy Inputs					
Fuel Oil	53.9	63.2	67.5	70.3	62.4
Natural Gas	23.2	26.6	40.6	37.1	31.1
Coal	49.7	52.5	69.5	168.4	61.9
Electricity	24.7	29.2	43.8	33.7	35.5
Energy Outputs					
Steam	37.9	42.9	54.4	38.4	52.7
Hot Water	50.0	128.5	35.3	52.4	64.5
Chilled Water	40.0	57.4	52.1	38.1	54.2
Electricity	54.1	63.8	56.3	58.5	48.9
Commercial Sector					
All Facilities	18.9	19.7	43.8	30.3	32.7
Principal Facility Activity					
College and University . .	31.8	32.7	65.6	49.0	52.3
Other School	28.2	38.6	55.2	61.9	139.5
Office	32.6	39.0	62.7	58.1	59.2
Hospital	26.0	30.9	53.9	43.8	38.2
Other	41.7	52.4	98.6	117.4	91.3
Census Region					
Northeast	36.9	39.4	69.2	69.1	79.8
Midwest	37.3	37.0	62.1	58.0	56.3
South	37.2	30.6	75.7	48.5	48.8
West	31.2	23.4	66.4	63.0	50.5
Energy Inputs					
Fuel Oil	24.7	24.5	71.5	39.6	41.9
Natural Gas	20.9	21.6	49.3	31.8	33.9
Coal	55.4	51.9	72.0	90.5	73.4
Electricity	23.2	22.9	53.6	31.5	35.0
Energy Outputs					
Steam	20.7	19.7	72.6	34.8	36.2
Hot Water	38.2	48.2	43.8	64.7	67.6
Chilled Water	28.7	34.0	58.6	30.3	39.7
Electricity	34.3	40.4	67.1	41.3	32.7

See footnotes at end of table.

Table D10. Relative Standard Errors for Central Physical Plant Energy Output Quantities (Continued)
(Percent)

Facility Characteristics	Total Outputs	Steam	Hot Water	Chilled Water	Electricity
Industrial Sector					
All Facilities	45.7	50.5	112.3	118.5	59.6
Census Region					
Northeast	107.8	116.2	201.0	264.6	129.2
Midwest	43.5	43.0	126.7	88.3	56.9
South	55.8	60.3	237.5	172.4	76.7
West	59.0	109.0	81.3	68.9	93.9
Energy Inputs					
Fuel Oil	65.3	73.5	302.4	165.2	69.6
Natural Gas	35.0	37.0	151.1	131.8	49.1
Coal	56.9	60.6	105.8	453.0	67.8
Electricity	41.2	42.7	110.7	100.5	55.3
Energy Outputs					
Steam	46.1	50.5	160.6	109.0	62.4
Hot Water	147.0	236.4	112.3	78.4	104.7
Chilled Water	124.1	152.7	162.7	118.5	181.2
Electricity	61.8	69.8	117.1	267.1	59.6

Note: "All Sectors" estimates include multibuilding residential facilities.

Source: Energy Information Administration, Office of Energy Markets and End Use, Form EIA-871B, "Facility Form" of the 1989 Commercial Buildings Energy Consumption Survey.

**Table D11. Relative Standard Errors for Number of Multibuilding Facilities by Types of Central Physical Plant Energy Inputs
(Percent)**

Facility Characteristics	Number of Facilities	Types of Energy Inputs			
		Fuel Oil	Natural Gas	Coal	Electricity
All Sectors					
All Facilities	19.6	33.3	23.4	53.3	27.1
Census Region					
Northeast	45.6	54.9	52.9	126.0	35.3
Midwest	43.6	55.8	26.4	40.6	59.9
South	30.6	47.4	41.8	59.6	44.4
West	39.7	82.9	45.4	81.2	46.5
Energy Inputs					
Fuel Oil	33.3	33.3	44.7	74.2	52.0
Natural Gas	23.4	44.7	23.4	48.4	32.6
Coal	53.3	74.2	48.4	53.3	49.8
Electricity	27.1	52.0	32.6	49.8	27.1
Energy Outputs					
Steam	23.4	36.5	27.8	56.6	34.5
Hot Water	34.2	42.2	32.7	109.1	45.5
Chilled Water	22.1	58.3	25.4	74.1	24.9
Electricity	39.9	54.4	45.5	73.4	51.2
Commercial Sector					
All Facilities	20.1	24.0	17.9	77.8	18.7
Principal Facility Activity					
College and University . . .	28.4	58.8	32.8	62.8	29.4
Other School	41.0	58.6	43.5	85.8	42.9
Office	42.4	82.8	38.2	306.0	53.6
Hospital	28.2	38.0	31.5	131.1	33.9
Other	35.1	61.3	38.3	205.3	48.7
Census Region					
Northeast	30.8	37.6	50.6	141.1	48.2
Midwest	29.6	60.3	29.8	60.1	36.6
South	40.9	51.5	39.0	91.7	32.2
West	24.1	51.6	27.7	82.0	30.4
Energy Inputs					
Fuel Oil	24.0	24.0	30.7	102.4	37.5
Natural Gas	17.9	30.7	17.9	74.8	20.2
Coal	77.8	102.4	74.8	77.8	68.1
Electricity	18.7	37.5	20.2	68.1	18.7
Energy Outputs					
Steam	26.7	26.2	17.8	79.0	24.2
Hot Water	35.1	45.8	38.6	115.3	35.9
Chilled Water	19.1	41.1	19.8	82.4	23.6
Electricity	41.7	70.8	41.6	79.5	44.9

See footnotes at end of table.

Table D11. Relative Standard Errors for Number of Multibuilding Facilities by Types of Central Physical Plant Energy Inputs (Continued)
(Percent)

Facility Characteristics	Number of Facilities	Types of Energy Inputs			
		Fuel Oil	Natural Gas	Coal	Electricity
Industrial Sector					
All Facilities	30.6	43.9	39.4	72.2	44.7
Census Region					
Northeast	76.4	85.0	76.8	242.6	58.4
Midwest	71.7	53.8	75.2	41.3	96.2
South	41.4	52.4	57.6	76.4	58.2
West	120.0	278.1	128.9	NC	148.9
Energy Inputs					
Fuel Oil	43.9	43.9	59.8	79.5	70.9
Natural Gas	39.4	59.8	39.4	64.9	54.3
Coal	72.2	79.5	64.9	72.2	55.9
Electricity	44.7	70.9	54.3	55.9	44.7
Energy Outputs					
Steam	33.6	44.4	41.2	81.8	52.5
Hot Water	78.3	168.1	127.3	501.9	81.4
Chilled Water	97.7	187.7	103.9	148.8	98.2
Electricity	50.9	61.2	73.2	76.9	101.6

Note: "All Sectors" estimates include multibuilding residential facilities.

Source: Energy Information Administration, Office of Energy Markets and End Use, Form EIA-871B, "Facility Form" of the 1989 Commercial Buildings Energy Consumption Survey.

Table D12. Relative Standard Errors for Central Physical Plant Energy Input Quantities
(Percent)

Facility Characteristics	Total Inputs	Fuel Oil	Natural Gas	Coal	Electricity
All Sectors					
All Facilities	42.8	79.1	24.8	96.5	63.1
Census Region					
Northeast	43.3	62.3	57.8	101.8	54.6
Midwest	28.8	58.7	35.8	42.1	54.1
South	60.5	92.4	42.9	172.4	92.8
West	33.3	84.5	36.2	135.0	44.8
Energy Inputs					
Fuel Oil	63.0	79.1	32.3	159.3	100.6
Natural Gas	22.3	27.7	24.8	48.5	42.6
Coal	108.3	177.4	69.9	96.5	263.8
Electricity	37.7	42.5	27.4	77.0	63.1
Energy Outputs					
Steam	44.3	79.3	26.7	97.0	68.7
Hot Water	41.5	48.4	62.7	80.7	67.7
Chilled Water	78.2	90.0	34.3	147.1	124.7
Electricity	70.0	92.6	39.8	113.4	185.9
Commercial Sector					
All Facilities	21.3	59.2	19.7	60.5	38.0
Principal Facility Activity					
College and University	39.4	148.9	37.3	65.2	67.8
Other School	36.2	80.3	46.2	82.3	85.0
Office	34.2	62.7	43.2	125.9	48.3
Hospital	34.0	29.4	39.0	147.2	55.4
Other	39.2	57.3	44.9	132.6	70.5
Census Region					
Northeast	35.1	81.2	45.4	98.0	40.4
Midwest	41.8	60.5	44.0	67.4	75.8
South	41.6	54.6	35.1	79.4	65.2
West	32.1	84.7	40.0	106.8	57.8
Energy Inputs					
Fuel Oil	24.0	59.2	33.2	51.9	31.6
Natural Gas	22.7	32.0	19.7	66.9	39.1
Coal	60.5	60.3	79.3	60.5	57.0
Electricity	26.6	34.3	27.4	66.6	38.0
Energy Outputs					
Steam	24.2	61.6	21.3	61.6	44.6
Hot Water	41.3	60.5	45.2	74.0	71.0
Chilled Water	34.6	40.1	29.7	97.4	43.6
Electricity	44.4	59.6	40.1	75.7	57.6

See footnotes at end of table.

Table D12. Relative Standard Errors for Central Physical Plant Energy Inputs (Continued)
(Percent)

Facility Characteristics	Total Inputs	Fuel Oil	Natural Gas	Coal	Electricity
Industrial Sector					
All Facilities	53.5	90.2	35.0	122.4	88.1
Census Region					
Northeast	77.0	61.7	88.4	112.4	103.8
Midwest	39.2	89.1	70.3	50.4	65.6
South	64.7	93.5	47.2	175.4	115.7
West	63.1	157.7	74.1	NC	72.1
Energy Inputs					
Fuel Oil	75.3	90.2	54.3	188.7	116.0
Natural Gas	31.3	52.9	35.0	60.0	58.5
Coal	133.3	178.6	110.2	122.4	286.7
Electricity	59.0	77.0	42.3	139.5	88.1
Energy Outputs					
Steam	53.9	90.1	35.6	122.6	92.5
Hot Water	122.5	171.1	211.8	173.3	129.3
Chilled Water	219.0	274.3	162.6	417.7	246.5
Electricity	80.6	94.4	61.2	142.5	264.7

Note: "All Sectors" estimates include multibuilding residential facilities. "Total Inputs" includes inputs of other fuels, not shown separately.

Source: Energy Information Administration, Office of Energy Markets and End Use, Form EIA-871B, "Facility Form" of the 1989 Commercial Buildings Energy Consumption Survey.

**Table D13. Relative Standard Errors for Central Physical Plant Energy Output-Input Ratios
(Percent)**

Facility Characteristics	Total Outputs	Total Inputs	Output/Input Ratio
All Sectors			
All Facilities	36.4	42.8	19.0
Census Region			
Northeast	52.9	43.3	22.4
Midwest	30.6	28.8	12.6
South	51.8	60.5	26.4
West	30.7	33.3	11.4
Energy Inputs			
Fuel Oil	53.9	63.0	27.7
Natural Gas	23.2	22.3	9.9
Coal	49.7	108.3	27.2
Electricity	24.7	37.7	18.0
Energy Outputs			
Steam	37.9	44.3	20.2
Hot Water	50.0	41.5	16.9
Chilled Water	40.0	78.2	26.7
Electricity	54.1	70.0	28.2
Commercial Sector			
All Facilities	18.9	21.3	11.4
Principal Facility Activity			
College and University	31.8	39.4	16.2
Other School	28.2	36.2	26.1
Office	32.6	34.2	16.4
Hospital	26.0	34.0	23.3
Other	41.7	39.2	25.7
Census Region			
Northeast	36.9	35.1	28.2
Midwest	37.3	41.8	15.3
South	37.2	41.6	20.4
West	31.2	32.1	13.0
Energy Inputs			
Fuel Oil	24.7	24.0	14.9
Natural Gas	20.9	22.7	11.3
Coal	55.4	60.5	7.6
Electricity	23.2	26.6	12.5
Energy Outputs			
Steam	20.7	24.2	13.4
Hot Water	38.2	41.3	16.8
Chilled Water	28.7	34.6	13.6
Electricity	34.3	44.4	17.9

See footnotes at end of table.

**Table D13. Relative Standard Errors for Central Physical Plant Energy Output-Input Ratios
(Continued)
(Percent)**

Facility Characteristics	Total Outputs	Total Inputs	Output/Input Ratio
Industrial Sector			
All Facilities	45.7	53.5	23.4
Census Region			
Northeast	107.8	77.0	29.5
Midwest	43.5	39.2	11.3
South	55.8	64.7	27.6
West	59.0	63.1	17.3
Energy Inputs			
Fuel Oil	65.3	75.3	32.5
Natural Gas	35.0	31.3	15.7
Coal	56.9	133.3	29.2
Electricity	41.2	59.0	26.2
Energy Outputs			
Steam	46.1	53.9	24.1
Hot Water	147.0	122.5	28.3
Chilled Water	124.1	219.0	49.4
Electricity	61.8	80.6	32.0

Note: "All Sectors" estimates include multibuilding residential facilities.

Source: Energy Information Administration, Office of Energy Markets and End Use, Form EIA-871B, "Facility Form" of the 1989 Commercial Buildings Energy Consumption Survey.