

Illinois State Building Energy Expense Study FY2008 and Projected FY2009-2011

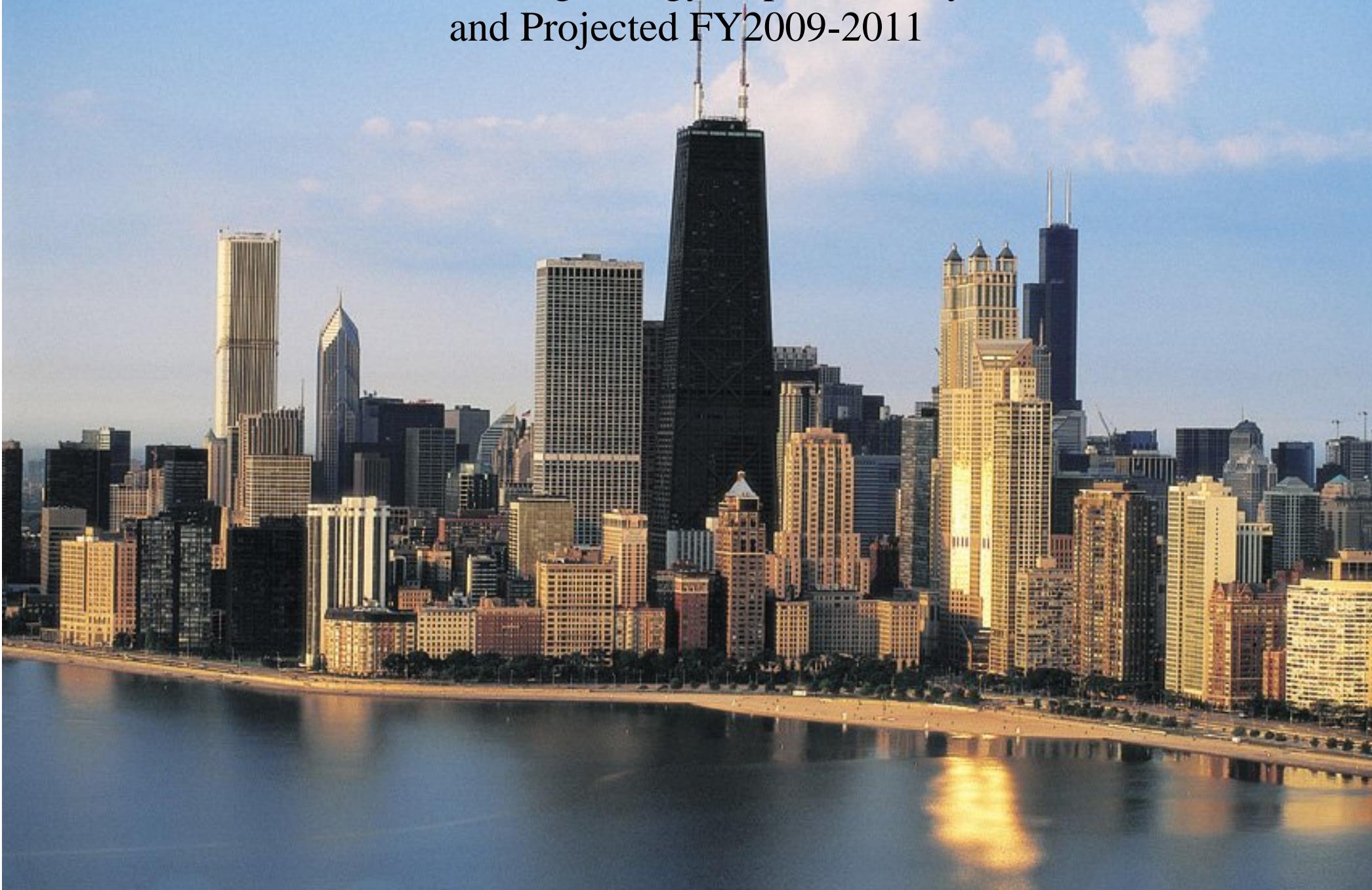




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Illinois Department of Commerce and Economic Opportunity
State Building Energy Program
620 East Adams Street
Springfield, Illinois 62701

Pat Quinn, Governor
Warren Ribley, Director

Executive Summary

During FY08, the state of Illinois spent \$217,170,086 for natural gas, electricity, coal, oil, propane, and steam (there was no purchased steam reported in FY08) to operate state-owned and leased buildings. This is 14.4 percent more than FY07. Energy consumption for FY08 was 20,850,291 MMBtu; which is 20.9 percent more than FY07.

The increase in energy costs can be attributed to increases in consumption in almost all state of Illinois facilities, and significant increases in the average price of natural gas, oil , and coal for all State agencies, while electricity costs remained at about the same levels. Also, the State of Illinois increased its contribution to the universities by 9.2% (62.4% in FY07 and 71.6% in FY08). There were 20.1 percent more cooling degree days than FY07. The cooling degree days for FY08 were 20.1% above the 10 year norm.

Energy prices were mitigated by several factors. The State has continued to consolidate large purchases of natural gas. In FY08, aggregated purchasing of electricity has continued for all large users in the Commonwealth Edison and Ameren territories. This has had a dramatic impact on stabilizing energy costs for the State well below the private sector.

Energy costs are projected to increase to as much as \$303 million by FY11 due to increasing fuel prices; however, due to the recent volatility in commodity prices, this projection is highly uncertain. Natural gas prices are expected to remain volatile for the next few years, and assuming normal weather. Electric deregulation which took effect January 1, 2007 will have a significant impact on electric rates throughout the State. The Department of Commerce and Economic Opportunity (DCEO) is actively working with state building managers to decrease energy consumption. Energy Performance Contracting (EPC) projects and energy programs over the past ten years have resulted in cost savings of over \$47 million.

The Department of Central Management Services, under the Facilities Management, Internal Auditing and Staff Legal functions Executive Order, assumed control of smaller agencies' facility operations beginning in FY05. This included payment of utility bills. The result is a large increase in the utility expenditures reported to the Comptrollers office for Central Management Services. The ability to separate these expenditures by agency is not available at this time.

In this report, DCEO identifies energy costs for Illinois state buildings, by fuel type and by agency, for FY04 through FY08. It also projects energy costs for FY09 through FY11 based on expenditures of representative state agencies. Adjustments to the FY04 energy consumption, FY05 energy costs and FY06 energy consumption have been made to reflect the most accurate data.

Figure 1 illustrates the energy cost history for Illinois state buildings from FY80 through FY08 with cost projections for FY09-11. State buildings' energy expenditures steadily increased from FY80 through FY84. From FY84 through FY86 the costs were essentially level due to falling fossil fuel prices. FY87 and FY88 building costs decreased because of some lower utility rates and energy conservation.

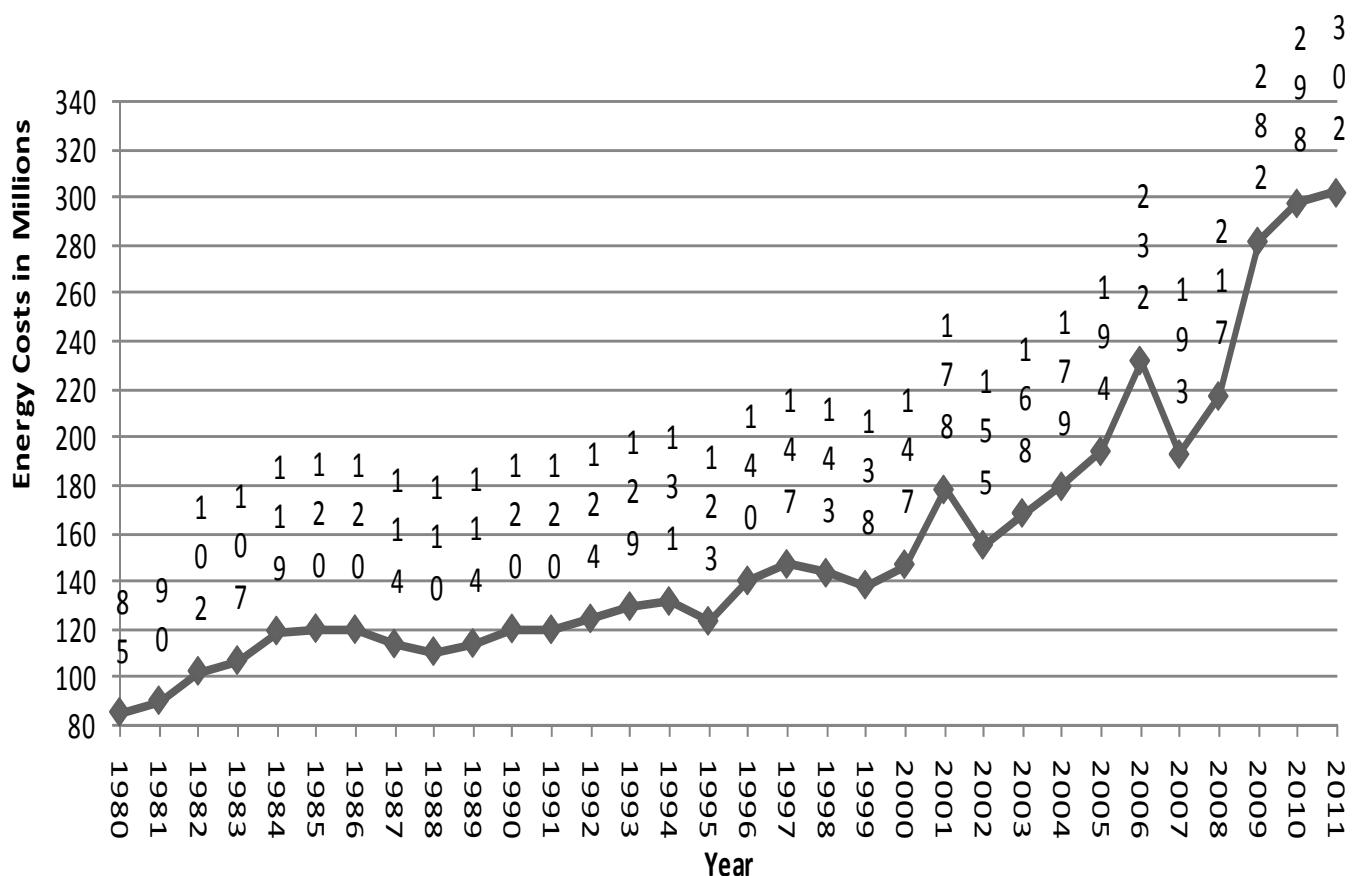
Except for FY95, when there was a dip in natural gas prices, expenditures for fuels increased from FY91 through FY97 due to steadily increasing fuel prices and the addition of new buildings. Electricity and natural gas prices declined at state facilities in FY98 and FY99. The spikes in energy costs in FY01 and FY03 through FY06 are a result of natural gas and electrical price fluctuations.

➤ **Figure 1**

The graph presented in Figure 1 is based on data from Table A-3 (State Building Energy Costs and Projections), which details costs for various fuel sources.

For simplicity in calculation it was assumed that the amount of energy consumed, in terms of Btus, would remain constant from FY09 to FY11 (assuming normal weather conditions). Energy usage and weather data since FY81 were used to determine how much energy the State would have used if the weather during FY08 had been normal (6,714 heating and cooling degree days). This value was then used in the projections. The description of Table A-3 explains the methodology.

Figure 1
State of Illinois Building Energy Cost and Predictions FY80 through FY11, vertical axis "energy Costs in Millions"



Tables 1 and 2 list the building energy cost and consumption figures for the 10 Illinois agencies that incurred the highest energy costs during FY05. Universities, the Department of Corrections (DOC), and the Department of Central Management Services (CMS) were the three largest users of energy, expending 52.7 percent, 12.6 percent and 9.6 percent of the total state building energy costs, respectively.

Electricity accounted for nearly 53.7 percent of the total energy cost, but only 26.0 percent of the total energy consumed (see Figures 3 and 4). At the same time, natural gas accounted for 41.4 percent of the total energy cost and 52.7 percent of the total energy consumed. This illustrates that electricity costs are considerably more per unit of energy than natural gas.

Figure 2, 3, and 4 display the same information graphically.

➤ TABLE 1

The energy expenditures in this study are taken from the Comptroller's Data Warehouse for FY08. The energy consumption of 83 state agencies, which utilize over 89 million square feet of buildings, is included. The state agencies that are listed individually in this report were chosen because each one accounts for approximately 1 percent or more of the total state buildings energy costs in each year. The remainder is listed under "All Others." Those energy expenditures made by leased facilities that pay a constant rental charge, but do not pay for utilities directly, are not included in this report.

Table 1 shows the amount of money (excluding gasoline expenditures) that was spent on energy by the State. The energy costs incurred by Universities are taken directly from Board of Higher Education report. The remainder is taken from the FY08 Comptroller's Data Warehouse. The specific accounts, from which expenditures are included, are listed below.

Account 1251 – Natural Gas

The account includes charges for natural gas furnished by public utilities. This excludes repair, maintenance, rental or equipment sales.

Table 1

State of Illinois FY08 Building Energy Cost (\$)¹

Agency ²	Natural Gas	Electricity	Coal	Fuel Oil	Purchased Steam	Total Building Energy Cost ³	% of Total Building Energy Cost
Universities⁴	62,046,333	46,136,004	6,091,084	175,348	0	114,448,769	52.7
Corrections	11,118,578	15,618,362	498,841	209,618	***	27,445,398	12.6
Human Services	4,578,971	6,900,614	1,524,569	10,182	***	13,014,336	6.0
Central Management Services⁵	4,116,083	16,808,790	***	11,903	***	20,936,776	9.6
Transportation	1,489,826	9,690,808	***	219,378	***	11,400,012	5.2
Secretary of State	244,616	5,931,740	535,505	5,335	***	6,717,196	3.1
Illinois Tollway	901,573	3,459,002	***	5,253	***	4,365,828	2.0
Natural Resources	317,388	2,387,086	***	646,967	***	3,351,441	1.5
Military Affairs	1,867,486	1,895,545	***	199,809	***	3,962,840	1.8
State Police	353,730	1,096,591	***	31,699	***	1,482,020	0.7
All Others⁶	2,963,665	6,665,625	371,189	44,992	***	10,045,471	4.6
Total	\$89,998,248	\$116,590,167	\$9,021,188	\$1,560,483	\$0	\$217,170,086	100.0

¹ Based on FY08 Comptroller's Data Warehouse records. Natural Gas numbers based on account 1251; Electricity - 1252; Coal - 1341; and Fuel Oil - 1342.

² The agencies in this category expended approximately 1 percent or more of the State's total building energy costs.

³ Gasoline not included.

⁴ Based on FY08 data from Board of Higher Education.

⁵ CMS expenditures and energy use contain data from multiple agencies.

Account 1252 – Electricity

The account includes charges for electric power furnished by public utilities. This excludes repair, maintenance, rental or equipment sales.

Account 1254 – University Central Plant Services

Payments by a university to a central service organization for purchased steam, including maintenance of these buildings. Using information from the Board of Higher Education, other fuel types have been separated from this account and added to their respective columns. Other agencies may purchase steam; however, it is impossible to distinguish steam costs with accounting data alone.

Account 1341 – Coal and Coke

These are charges for purchasing coal and coke including related freight or switching charges.

Account 1342 – Fuel Oil and Bottled Gas

These are charges for acquisition of oil or bottled gas for use as fuel in power or heating plants or oil stoves, including related freight or switching charges. The column in Table 1 titled "Fuel Oil" includes the relatively small amount of bottled gas purchased by state agencies.

➤ TABLE 2

Table 2 shows the amount of energy (in millions of Btus) consumed by state agencies. Those figures were developed by converting the cost per year data from Table 1 to consumption. When possible, actual agency energy consumption and cost data were used (e.g. Universities, Human Services and Corrections). If not, The Department of Human Services price averages were used since these were assumed to be representative of prices paid by other state facilities.

The price of oil was based only on the University price, because reliable Human Services data were not available.

The fuel prices and conversion factors are listed in the Table 2 footnotes. Table A-2 lists unit energy cost by fuel type.

Table 2**State of Illinois FY08 Building Energy Consumption (10^6 Btu)**

Agency ¹	Natural Gas	Electricity	Coal	Fuel Oil	Purchased Steam	Total Building Consumption	Total Building Consumption	% of Total
Universities ²	7,064,413	2,108,942	2,615,438	7,840	***	11,796,633		56.6
Corrections ³	1,908,441	732,294	257,134	15,868	***	2,913,737		14.0
Human Services	605,684	323,547	785,860	771	***	1,715,862		8.2
Central Management Services ⁴	544,455	788,109	***	901	***	1,333,465		6.4
Transportation	197,067	454,370	***	16,607	***	668,044		3.2
Secretary of State	32,357	278,120	276,034	404	***	586,915		2.8
Illinois Tollway	119,256	162,181	***	398	***	281,835		1.4
Natural Resources	41,983	111,923	***	48,976	***	202,882		1.0
Military Affairs	247,022	88,876	***	15,126	***	351,024		1.7
State Police	46,790	51,416	***	2,400	***	100,606		0.5
All Others	392,019	312,529	191,334	3,406	***	899,288		4.3
Total	11,199,487	5,412,307	4,125,800	112,697	0	20,850,291		100.0

¹ Energy consumption for all agencies, except Universities and Corrections, is based on adjusted average Human Services FY08 unit energy costs as follows:

Natural Gas	\$0.756/therm	or	$\$7.56/10^6$ Btu (1 therm = 100,000 Btu)
Electricity	\$0.0728/kwh	or	$\$21.330/10^6$ Btu (1 kwh = 3,413 Btu)
Coal	\$42.750/ton	or	$\$1.940/10^6$ Btu (1 lb. = 11,018 Btu)
Oil (#2)	\$1.83/gal	or	$\$13.21/10^6$ Btu (1 gal = 138,974 Btu)

² University unit costs:

Natural Gas	\$0.878/therm	or	$\$8.78/10^6$ Btu (1 therm = 100,000 Btu)
Electricity	\$0.0747/kwh	or	$\$21.88/10^6$ Btu (1 kwh = 3,413 Btu)
Coal	\$51.79/ton	or	$\$2.33/10^6$ Btu (1 lb. = 11,190 Btu)
Oil & Propane	\$2.73/gal	or	$\$22.37/10^6$ Btu (1 gal = 136,049 Btu)
Steam	No steam purchase was reported (1 lb. steam = 1,000 Btu)		

³ Corrections Natural Gas \$0.583/therm or $\$5.830/10^6$ Btu (1 therm = 100,000 Btu)

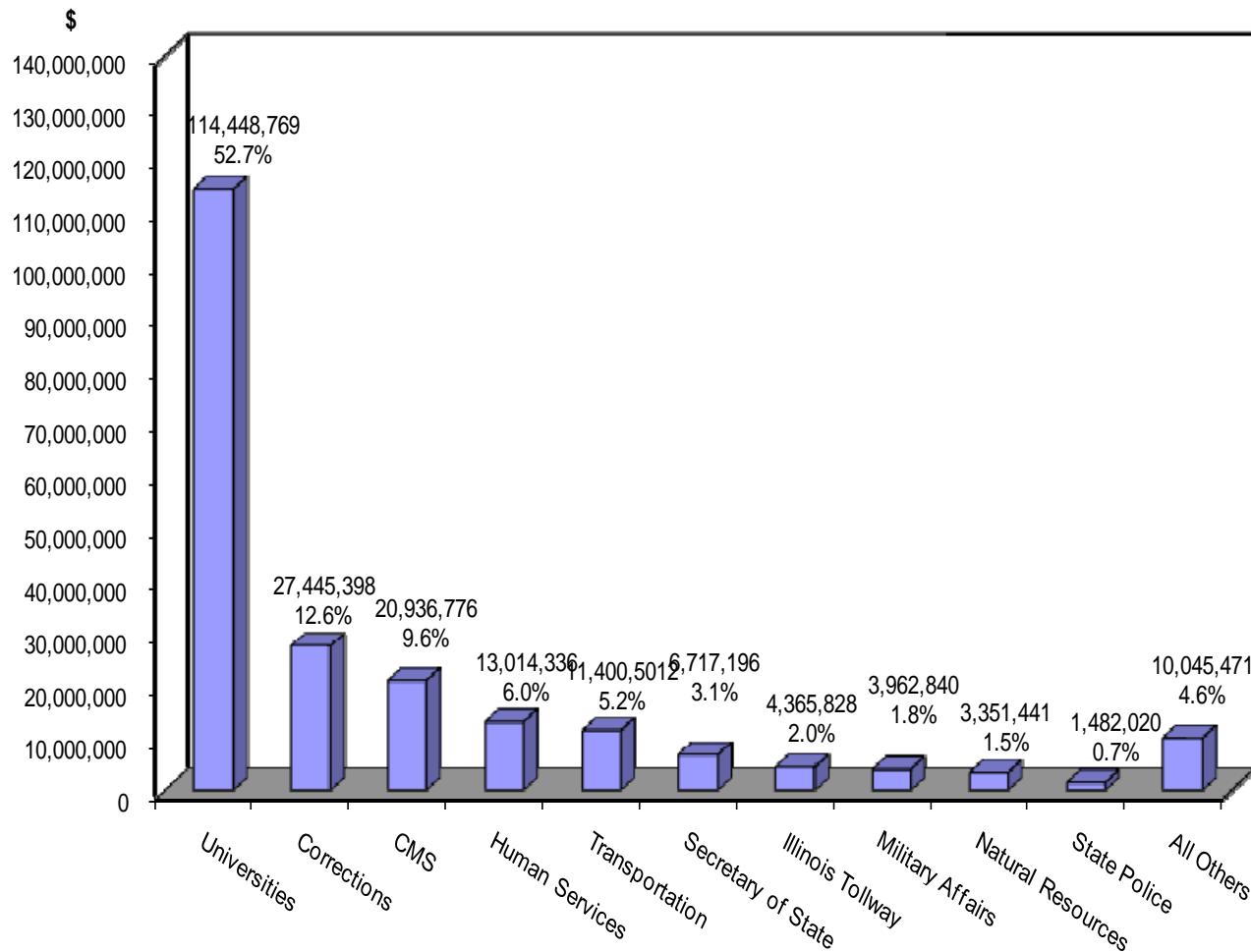
Figure 2 illustrates building energy cost for the 10 Illinois agencies that incurred the highest energy costs for FY08. Universities, the Department of Corrections, and the Department of Central Management Services were the three largest single users of energy, expending 52.7 percent, 12.6 percent, and 9.6 percent of the total state building energy costs, respectively.

➤ **Figure 2**

The energy expenditures in this study are taken from the Comptroller's Data Warehouse for FY08. The state agencies that are listed individually in this report were chosen because each one accounts for approximately 1 percent or more of the total state buildings energy costs in each year. The remainder is listed under "All Others." Those energy expenditures made by leased facilities that pay a constant rental charge, but do not pay for utilities directly, are not included in this report.

Expenditures by CMS contain data from multiple agencies.

Figure 2
State of Illinois FY08 Building Energy Cost By Agency (Total = \$217,170,086)

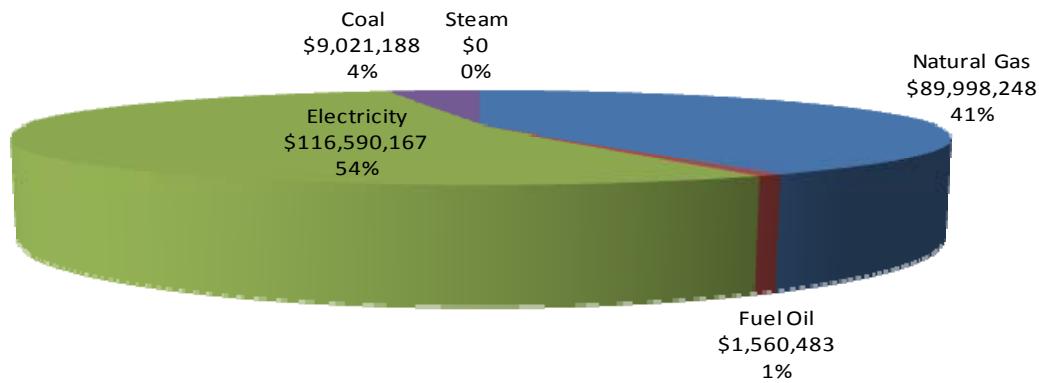


➤ **Figure 3**

Figure 3 illustrates the state buildings energy cost for FY08 presented graphically by fuel type. Data from Table 1 was used to show that electricity accounts for the greatest energy cost: 53.7 percent of the total of all buildings energy costs. Natural gas cost accounts for 41.4 percent of the total energy costs followed by coal, fuel oil and steam which account for 4.1 percent, 0.7 percent, and 0 percent, respectively.

Figure 3

State of Illinois FY08 Building Energy Cost by Fuel Type (Total = \$217,170,086)



➤ **Figure 4**

Figure 4 illustrates the state buildings energy consumption for FY08 presented graphically by fuel type. Data from Table 2 was used to show that natural gas accounts for the highest fuel consumption: 53.7 percent of the total of all buildings' energy consumption. Electricity consumption accounts for 26.0 percent of the total buildings' energy consumption followed by coal, fuel oil and steam which account for 19.8 percent, 0.5 percent, and 0 percent, respectively.

Figure 4

State of Illinois FY08 Building Energy Consumption by Fuel Type
(Total = $20,850,291 \times 10^6$ Btu)

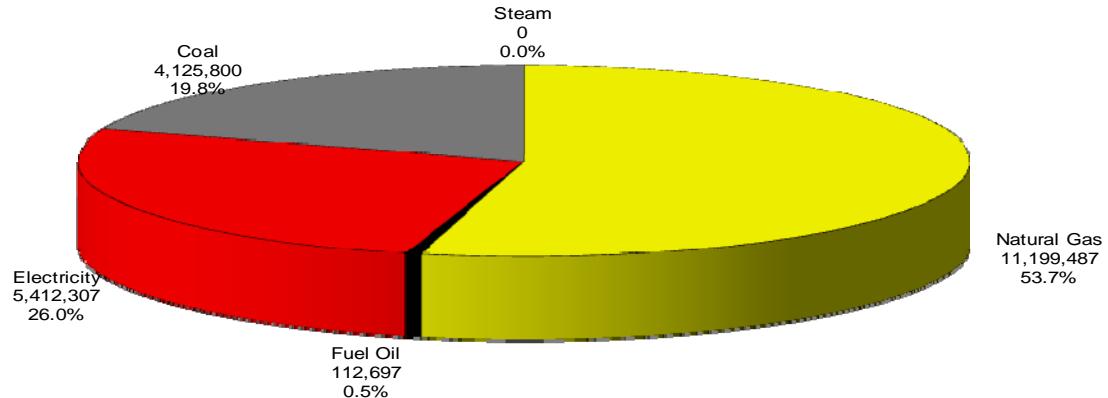


Table 3 lists the 10 agencies' energy and cost index numbers, which can be used for monitoring the progress of an energy conservation program. The building area figures used to generate these index numbers are only estimates because accurate agency totals are not readily available. The wide range of energy index numbers is due to the various types and uses of buildings by the different agencies.

➤ **Table 3**

In Table 3, cost index numbers and energy index numbers are generated by using information from Tables 1 and 2 and gross building area data from each state agency. The gross building area figures are obtained directly from the agencies and compared to Capital Development Board records. The energy and cost index numbers that appear in Table 3 include some energy charges for leased buildings for which the State pays the utility costs.

Many of the building area table figures are updated from previous reports as new and more accurate information becomes available. Agency-to-agency facility transfers and closings and new building openings all contribute to overall building inventory changes. Changes in agency gross area can mean similar differences in both cost and energy index numbers when compared from year to year. Such changes can yield discontinuity from year to year and can alter significantly the current energy cost and use position of those affected.

Table 3
State of Illinois FY08 Building Energy Index Number Data

Agency	Fuel Cost Total	Energy Use Total (x 10⁶ Btu)	Building Area⁴ (x 10⁶ Sq. Ft.)	Energy Index²	Cost Index³
				Btu/Sq. Ft /Yr.	\$/Sq. Ft /yr.
Universities	114,448,769	11,796,633	40.31	292,648	2.84
Corrections	27,445,398	2,913,737	15.61	186,658	1.76
Human Services	13,014,336	1,715,862	9.10	188,556	1.43
Central Management Services⁵	20,936,776	1,333,465	*** ¹	*** ¹	*** ¹
Transportation	11,400,012	668,044	2.23	299,571	5.11
Secretary of State	6,717,196	586,915	3.79	154,859	1.77
Illinois Tollway	4,365,828	281,835	3.82	73,779	1.14
Natural Resources	3,351,441	202,882	0.90	225,424	3.72
Military Affairs	3,962,840	351,024	3.89	90,168	1.02
State Police	1,482,020	100,606	0.76	132,376	1.95
All Others	10,045,471	899,288	*** ¹	*** ¹	*** ¹
Total	\$217,170,086	20,850,291	***	***	***

¹ Accurate building area figure not available.

² Energy Index = Amount of energy used per square foot per year.

³ Cost Index = cost of energy used per square foot per year.

⁴ These figures are estimates based on best available data and may change from year to year as current data becomes available. See Table 3 description for further clarification.

⁵ CMS expenditures and energy use contain data from multiple agencies.

Tables 4 and 5 list buildings' energy cost and consumption comparisons for FY04 through FY08. The data show a total cost increase of 12.9 percent from FY07 to FY08 and a consumption increase of 20.0 percent for the same period.

➤ **Table 4**

Table 4 gives a five-year energy cost history for the different agencies reported and then compares each year's cost to the previous year's to give a percentage cost change. The data in the five columns are taken from the various cost tables from this report.

Cost variations from year to year can be attributed to several factors that are listed below.

1. *Fuel Prices*

Fuel prices for the last seven years have had drastic increases as compared to the relatively stable prices in the 80's and 90's. These increases have been mitigated by purchasing programs instigated by CMS. Changing fuel prices significantly affect the total yearly energy costs.

2. *Weather Conditions*

As noted in the footnote to Table 4, no attempt has been made to adjust the results to reflect climatic variations from year to year and climatic differences from north to south.

3. *Facility Changes*

In recent years factors such as economics have caused the closing or opening of facilities in some agencies. This would have an effect on energy cost from year to year that is not taken into account in this report.

4. *Conservation*

The drastically increasing fuel prices in the past seven years, has again prompted a nationwide awareness of the need for energy conservation. This renewed public awareness has encouraged the state to adopt measures to conserve energy. While the conservation factor is disregarded for cost projections, it has affected the energy cost totals of Table 4.

Table 4

State of Illinois FY04 through FY08 Building Energy Cost Comparison¹

Agency	FY04 Energy Cost (x \$1000)	FY05 Energy Cost (x \$1000)	FY06 Energy Cost (x \$1000)	FY07 Energy Cost (x \$1000)	FY08 Energy Cost (x \$1000)
Universities	89,320.0 (14.0)	102,493.6 (14.7)	121,964.2 (19.0)	101,491.6 (-16.8)	114,448.8 (12.8)
Corrections	30,183.6 (8.6)	30,315.4 (0.4)	37,053.8 (22.2)	30,358.1 (-18.1)	27,445.4 (-9.6)
Human Services	16,074.2 (3.5)	13,329.5 (-17.1)	16,150.4 (21.2)	13,126.1 (-18.7)	13,014.3 (-0.9)
Central Management Services³	4,970.1 (6.4)	13,323.8 (168.1)	19,480.1 (46.2)	15,881.1 (-18.5)	20,936.8 (31.8)
Transportation	10,583.5 (-8.2)	10,938.3 (3.4)	9,519.5 (-13.0)	8,617.5 (-9.5)	11,400.0 (32.3)
Secretary of State	5,814.4 (-9.6)	5,225.3 (-10.1)	6,931.7 (32.7)	5,078.8 (-26.7)	6,717.2 (32.3)
Illinois Tollway	3,234.5 (-5.8)	3,286.4 (1.6)	4,118.4 (25.3)	4,118.4 (0.0)	4,365.8 (6.0)
Natural Resources	3,331.4 (-4.7)	3,259.7 (-2.2)	3,035.3 (-6.9)	2,471.4 (-18.6)	3,351.4 (35.6)
Military Affairs	2,993.5 (7.8)	3,199.3 (6.9)	4,008.4 (25.3)	2,940.0 (-26.7)	3,962.8 (34.8)
State Police	1,927.1 (7.4)	1,910.0 (-0.9)	1,490.5 (-22.0)	1,197.5 (-19.7)	1,482.0 (23.8)
Children & Family Services³	1,506.4 (-6.5)	***	***	***	***
All Others³	9,483.2 (-12.4)	6,808.3 (-28.2)	8,252.9 (21.2)	7,096.5 (-14.0)	10,045.5 (41.6)
Total	179,421.9 (6.6)	194,089.7 (8.2)	232,005.4 (19.5)	192,377.1 (-17.1)	217,170.1 (12.9)

¹ Due to diverse weather conditions in Illinois, no attempt has been made to adjust the results to reflect climate severity from year to year and climatic differences from north to south. Representative weather data are shown on Table 5.

² Brackets denote percentage change from previous year.

³ CMS expenditures and energy use contain data from multiple agencies. Starting in FY05, Children & Family Services and some smaller agencies in the All Others group are included in the CMS data.

➤ **Table 5**

Table 5 presents a five-year energy consumption history for the agencies listed, and then compares each year's use to the previous year's to give percentage consumption change. The data in the five columns are taken from the various consumption tables in this report.

Consumption variations from year to year can be attributed to the same factors that affected the cost variations in Table 4 (except fuel prices.)

An indication of weather variation over the last five years is given by the Heating Degree Day and Cooling Degree Day lines at the bottom of the table. A Heating or Cooling Degree Day is a unit, based on temperature difference and time, used in estimating fuel consumption and specifying the nominal heating/cooling load of a building.

The degree day data shown are based on Peoria weather, which is considered to be representative of the state. These data should be used only for identifying weather trends. No attempt should be made to normalize the consumption data given in order to compensate for weather differences.

Table 5

State of Illinois FY04 through FY08 Building Energy Consumption Comparison ¹

Agency	FY04 Energy Consumption (10 ⁹ BTU)	FY05 Energy Consumption (10 ⁹ BTU)	FY06 Energy Consumption (10 ⁹ BTU)	FY07 Energy Consumption (10 ⁹ BTU)	FY08 Energy Consumption (10 ⁹ BTU)
Universities	9,615.9 (-14.6)	9,660.2 (0.5)	10,771.5 (11.5)	9,835.7 (-8.7)	11,796.6 (19.9)
Corrections	3,027.0 (-0.2)	2,956.0 (-2.3)	2,912.5 (-1.5)	2,679.0 (-8.0)	2,913.7 (8.8)
Human Services	2,114.4 (-1.5)	1,935.4 (-8.5)	1,787.1 (-7.7)	1,722.1 (-3.6)	1,715.9 (-0.4)
Central Management Services ³	368.7 (-1.1)	938.3 (154.5)	1,212.0 (29.2)	988.9 (-18.4)	1,333.5 (34.8)
Transportation	711.5 (-7.1)	729.3 (2.5)	580.5 (-20.4)	483.6 (-16.7)	668.0 (38.1)
Secretary of State	477.3 (2.5)	528.7 (10.8)	604.1 (14.3)	431.1 (-28.6)	586.9 (36.2)
Illinois Tollway	248.0 (46.8)	241.0 (-2.8)	258.0 (7.1)	300.9 (16.7)	281.8 (-6.4)
Natural Resources	252.8 (-15.8)	229.8 (-9.1)	208.3 (-9.3)	142.2 (-31.7)	202.9 (42.6)
Military Affairs	294.5 (0.1)	293.5 (-0.3)	291.4 (-0.7)	96.4 (-66.9)	351.0 (264.3)
State Police	144.0 (-9.2)	140.0 (-2.8)	96.9 (-30.8)	78.6 (-18.9)	100.6 (28.1)
Children & Family Services ³	99.8 (-7.9)	***	***	***	***
All Others ³	814.2 (-17.0)	643.7 (-20.9)	673.5 (4.6)	619.1 (-8.1)	899.3 (45.3)
Total	18,168.2 (-8.5)	18,296.0 (0.7)	19,395.8 (6.0)	17,377.4 (-10.4)	20,850.3 (20.0)
HDD ⁴	6,107.0 (-15.9)	5,619.0 (-8.0)	5,421.0 (-3.5)	5,649.0 (4.2)	5,857.0 (3.7)
CDD	1,016.0 (0.7)	831.0 (-18.2)	816.0 (-1.8)	1,065.0 (30.5)	1,279.0 (20.1)

¹ Due to diverse weather conditions in Illinois, there has been no attempt made to adjust the results to reflect climatic variations from year to year and the climatic differences from north to south. Representative weather data are shown on Table 5

² Brackets denote percentage change from previous year.

³ CMS expenditures and energy use contain data from multiple agencies. Starting in FY05, Children & Family Services and some smaller agencies in the All Others group are included in the CMS data.

⁴ HDD/CDD refers to the Heating Degree Days and Cooling Degree Days for Peoria (Normal HDD = 6,097 and Normal CDD = 998). These numbers should be used for comparing weather trends only. Further discussion on their interpretation is given in the appendix, under Table 5 description.



Photo credit - Mike Gaillard

Appendix

➤ **Table A-1**

This table is prepared using data from Global Insight, Inc., U.S. Economic Outlook, January, 2007. The numbers are average fuel price multipliers for the years identified.

TABLE A-1

Unit Energy Cost Projection Multipliers by Fiscal Year¹

Energy Source	2009/2008	2010/2008	2011/2008
Natural Gas	1.0596	1.0452	1.0589
Electricity	1.2042	1.4178	1.4483
Coal	1.0484	1.0540	1.0489
Oil (#2)	1.0042	1.0103	1.0013
Oil (#6)	1.1331	1.0839	1.0823
Steam	1.0484	1.0540	1.0489

¹ Projection multipliers are found by averaging the quarterly Global Insight indices to obtain fiscal year indices and determining the percent change from the base year.

➤ **Table A-2**

Table A-2 shows the unit energy prices for FY04 through FY11. FY04 through FY08 are actual fuel costs and FY09 through FY11 are projected costs. The projection method used was to multiply the FY08 fuel price by its respective price multiplier from Table A-1, to obtain the specific fuel price for FY09 through FY11. That is current price X projection multiplier = projected price.

This table is prepared using data from the Illinois Board of Higher Education, Distributional Analysis of Energy Usage and Cost FY07 report and the Illinois State Water Survey, Power Plant Efficiency FY08 report.

Table A-2
Unit Energy Costs by Fuel Type

Energy Source	Actual					Projected ¹		
	FY04	FY05	FY06	FY07	FY08	FY09	FY10	FY11
Natural Gas (¢/therm)								
Human Services	69.30	80.30	120.50	89.40	75.60	76.59	77.21	78.24
Universities	69.90	74.60	91.60	75.10	87.80	88.95	89.67	90.87
Electricity (¢/kwh)								
Human Services	7.38	6.02	6.12	7.85	7.28	8.21	9.06	9.21
Universities	6.53	7.94	8.10	7.28	7.47	8.43	9.30	9.45
Coal (\$/ton)								
Human Services	32.64	34.35	40.82	39.90	42.75	42.96	43.21	43.39
Universities	29.81	33.00	49.48	40.39	51.32	51.57	51.88	52.09
Oil (\$/gal)								
Human Services	0.88	1.38	1.18	1.83	1.84	1.86	1.89	1.90
Universities	0.66	1.35	1.19	0.79	2.73	2.73	2.76	2.83
Steam (\$/1000 lb.)								
Universities	12.24	14.70	14.70	14.60	14.60	14.67	14.76	14.82

¹ Projected prices obtained by multiplying FY08 price by its respective projection multiplier (Table A-1).

➤ **Table A-3**

Table A-3 lists energy costs and projections from FY04 to FY11, by fuel types, FY04 through FY08 figures are actual and FY09 through FY11 figures are projected. In past reports (pre-FY85), projected costs were obtained by simply multiplying the current utility cost by its respective price multiplier (Table A-1). However, these projections were made assuming that the same amount of energy would be used each year, regardless of weather differences. If the weather during the current year happened to be mild (as it was in 1985), this led to conservative projections. If the weather during the current year was harsh (as it was in 1984), the projections would be over-estimated. To avoid these problems a projection method, which attempts to de-emphasize the weather effect, has been implemented.

The method used to obtain weather-normalized base year cost, for projections, is as follows:

1. Perform a linear regression on consumption totals against total degree days (heating plus cooling) for FY81 through FY08 to obtain the equation for the best fitting line through the data.
2. Substitute the current-year (7,136 DD) degree day number into the equation for the line obtained in step 1.
3. Substitute the normal-year (7095 DD) degree day number into the equation for the line obtained in step 1.
4. The weather-adjusted normal consumption is the current-year usage plus the usage found in step 3 minus the usage found in step 2. (20,850,291 MMBtu + 18,317,363 MMBtu - 18,081,276 MMBtu = 21,086,378 MMBtu.)
5. Break the weather-adjusted normal consumption (21,086,378 MMBtu) down by fuel types using the percentages from Figure 4.
6. Multiply each of these by its respective fuel cost in Table 1 divided by the respective fuel consumption in Table 2 to get current normalized dollar totals. (Natural Gas - \$125,167,845; Electricity - \$127,365,642; Coal - \$10,382,040; Oil - \$939,391; and Steam - \$0).
7. Project from these totals, using the multipliers from Table A-1.

TABLE A-3

State Building Energy Costs and Projections (x \$1000)

Energy Source	Actual					Projected ¹		
	FY04	FY05	FY06	FY07	FY08	FY09	FY10	FY11
Natural Gas	55,572	59,466	87,182	67,948	89,998	126,812	127,835	129,541
Electricity	110,766	120,689	125,694	110,692	116,590	143,663	158,514	161,167
Coal	5,288	5,975	8,056	6,356	9,021	10,432	10,495	10,537
Oil	1,159	1,242	1,566	1,919	1,560	950	966	971
Steam	6,637	6,717	9,507	5,959	5,959	0	0	0
Total	179,422	194,089	232,005	192,873	223,129	281,857	297,811	302,215

¹ Projected costs obtained by multiplying FY08 weather-adjusted utility cost by its respective projection multiplier (Table A-1)

Current weather-adjusted utility costs are: Natural Gas- \$125,167,845; Electricity \$127,365,842; Coal - \$10,382,040; Oil - \$939,391; Steam - \$0; total = \$263,854,919. A complete discussion of the procedure used is given in the following text.

➤ **Table A-4**

This table presents the expenditures on energy by the State for the Fiscal Year as reported in the respective Comptroller's Data Warehouse records. The same description and preparation methods as were used in Table 1 apply.

Table A-4

State of Illinois FY07 Building Energy Cost (\$)¹

Agency²	Natural Gas	Electricity	Coal	Fuel Oil	Purchased Steam	Total Building Energy Cost³	% of Total Building Energy Cost
Universities⁴	32,876,251	57,739,656	4,064,049	853,008	5,958,638	101,491,602	53.4
Corrections	14,599,577	12,378,089	441,620	166,519	***	27,585,805	14.5
Human Services	6,912,079	5,001,397	1,202,713	9,903	***	13,126,091	6.9
Central Management Services⁵	4,361,796	11,515,776	***	3,576	***	15,881,147	8.4
Transportation	1,506,471	6,927,927	***	183,122	***	8,617,519	4.5
Secretary of State	237,527	4,493,273	343,710	4,282	***	5,078,792	2.7
Illinois Tollway	1,464,802	3,145,504	***	4,492	***	4,614,799	2.4
Natural Resources	267,947	1,692,635	***	510,850	***	2,471,432	1.3
Military Affairs	1,506,470	1,307,240	***	126,261	***	2,939,971	1.5
State Police	378,532	800,271	***	18,734	***	1,197,538	0.6
All Others⁶	2,014,309	4,740,131	304,175	37,858	***	7,096,472	3.7
Total	\$66,125,760	\$109,741,898	\$6,356,267	\$1,918,605	\$5,958,638	\$190,101,169	100.0

¹ Based on FY07 Comptroller's Data Warehouse records. Natural Gas numbers based on account 1251; Electricity - 1252; Coal - 1341; and Fuel Oil - 1342.

² The agencies in this category expended approximately 1 percent or more of the State's total building energy costs.

³ Gasoline not included.

⁴ Based on FY07 data from Board of Higher Education.

⁵ CMS expenditures and energy use contain data from multiple agencies.

⁶ All remaining state agencies.

Table A-5

This table shows the amounts of energy consumed, in millions of Btus, by the State, for the Fiscal Year, respectively. The same description and preparation methods as were used in generating Table 2 apply.

Table A-5**State of Illinois FY07 Building Energy Consumption (10⁶ Btu)**

Agency ¹	Natural Gas	Electricity	Coal	Fuel Oil	Purchased Steam	Total Building Consumption	% of Total Building Consumption
Universities ²	4,377,663	2,708,239	2,232,994	108,663	408,126	9,835,685	56.6
Corrections ³	1,818,593	579,481	268,299	12,605	***	2,678,978	15.4
Human Services	773,163	217,452	730,688	750	***	1,722,053	9.9
Central Management Services ⁴	487,897	500,686	***	271	***	988,854	5.7
Transportation	168,509	301,214	***	13,862	***	483,585	2.8
Secretary of State	26,569	195,360	208,816	324	***	431,069	2.5
Illinois Tollway	163,848	136,761	***	340	***	300,949	1.7
Natural Resources	29,972	73,593	***	38,671	***	142,236	0.8
Military Affairs	29,972	56,837	***	9,558	***	96,367	0.6
State Police	42,341	34,794	***	1,418	***	78,553	0.5
All Others	225,314	206,093	184,796	2,866	***	619,069	3.6
Total	8,143,841	5,010,510	3,625,593	189,328	408,126	17,377,398	100.0

¹ Energy consumption for all agencies, except Universities and Corrections, is based on adjusted average Human Services FY07 unit energy costs as follows:

Natural Gas	\$0.894/therm	or	\$8.94/10 ⁶ Btu (1 therm = 100,000 Btu)
Electricity	\$0.0785/kwh	or	\$22.999/10 ⁶ Btu (1 kwh = 3,413 Btu)
Coal	\$39.902/ton	or	\$1.646/10 ⁶ Btu (1 lb. = 11,018 Btu)
Oil (#2)	\$1.83/gal	or	\$13.21/10 ⁶ Btu (1 gal = 138,974 Btu)

² University unit costs:

Natural Gas	\$0.751/therm	or	\$7.51/10 ⁶ Btu (1 therm = 100,000 Btu)
Electricity	\$0.0728/kwh	or	\$21.32/10 ⁶ Btu (1 kwh = 3,413 Btu)
Coal	\$40.39/ton	or	\$1.82/10 ⁶ Btu (1 lb. = 11,190 Btu)
Oil & Propane	\$0.79/gal	or	\$7.85/10 ⁶ Btu (1 gal = 136,049 Btu)
Steam	\$14.60/1000 lb.	or	\$14.60/10 ⁶ Btu (1 lb. steam = 1,000 Btu)

³ Corrections Natural Gas \$0.9031/therm or \$9.031/10⁶ Btu (1 therm = 100,000 Btu)

⁴ CMS expenditures and energy use contain data from multiple agencies.

➤ **Table A-6**

This table presents the expenditures on energy by the State for the Fiscal Year as reported in the respective Comptroller's Data Warehouse records. The same description and preparation methods as were used in Table 1 apply.

Table A-6

State of Illinois FY06 Building Energy Cost (\$)¹

Agency ²	Natural Gas	Electricity	Coal	Fuel Oil	Purchased Steam	Total Building Energy Cost ³	% of Total Building Energy Cost
Universities⁴	46,573,758	59,873,715	5,445,142	564,164	9,507,462	121,964,241	52.6
Corrections	19,029,553	17,372,014	520,136	132,103	***	37,053,806	16.0
Human Services	8,931,551	5,862,170	1,341,494	15,206	***	16,150,421	7.0
Central Management Services⁵	4,565,841	14,885,587	***	28,698	***	19,480,126	8.4
Transportation	1,483,601	7,884,259	***	151,662	***	9,519,522	4.1
Secretary of State	307,377	6,186,133	436,748	1,484	***	6,931,742	3.0
Illinois Tollway	1,026,090	3,085,206	***	7,149	***	4,118,445	1.8
Natural Resources	310,141	2,231,338	***	493,784	***	3,035,263	1.3
Military Affairs	2,242,521	1,656,092	***	109,797	***	4,008,410	1.7
State Police	455,545	1,012,842	***	22,112	***	1,490,499	0.6
All Others⁶	2,255,827	5,645,032	312,107	39,932	***	8,252,898	3.6
Total	\$87,181,805	\$125,694,388	\$8,055,627	\$1,566,091	\$9,507,462	\$232,005,373	100.0

¹ Based on FY06 Comptroller's Data Warehouse records. Natural Gas numbers based on account 1251; Electricity - 1252; Coal - 1341; Fuel Oil - 1342; and Purchased Steam - 1254.

² The agencies in this category expended approximately 1 percent or more of the State's total building energy costs.

³ Gasoline not included.

⁴ Based on FY06 data from Board of Higher Education.

⁵ CMS expenditures and energy use contain data from multiple agencies.

⁶ All remaining state agencies.

This table shows the amounts of energy consumed, in millions of Btus, by the State, for the Fiscal Year, respectively. The same description and preparation methods as were used in generating Table 2 apply.

Table A-7

State of Illinois FY06 Building Energy Consumption (106 Btu)

Agency 1	Natural Gas	Electricity	Coal	Fuel Oil	Purchased Steam	Total Building Consumption	% of Total Building Consumption
Universities 2	5,084,471	2,523,123	2,452,767	64,402	646,766	10,771,529	55.5
Corrections 3	1,650,438	968,340	278,148	15,578	***	2,912,504	15.0
Human Services	741,208	326,765	717,376	1,793	***	1,787,142	9.2
Central Management Services 4	378,908	829,743	***	3,384	***	1,212,035	6.2
Transportation	123,120	439,479	***	17,885	***	580,484	3.0
Secretary of State	25,508	344,823	233,555	175	***	604,061	3.1
Illinois Tollway	85,153	171,974	***	843	***	257,970	1.3
Natural Resources	25,738	124,378	***	58,229	***	208,345	1.1
Military Affairs	186,101	92,313	***	12,948	***	291,362	1.5
State Police	37,805	56,457	***	2,608	***	96,870	0.5
All Others	187,206	314,662	166,902	4,709	***	673,479	3.5
Total	8,525,656	6,192,057	3,848,748	182,554	646,766	19,395,781	100.0

1 Energy consumption for all agencies, except Universities and

2 University unit costs:

Corrections, is based on adjusted average Human Services
FY06 unit energy costs as follows:

Natural Gas	\$1.21/therm	or	\$12.05/106 Btu (1 therm = 100,000 Btu)
Electricity	\$0.061/kwh	or	\$17.94/106 Btu (1 kwh = 3,413 Btu)
Coal	\$40.82/ton	or	\$1.87/106 Btu (1 lb. = 11,190 Btu)
Oil (#2)	\$1.18/gal	or	\$8.48/106 Btu (1 gal = 138,974 Btu)

Natural Gas	\$0.916/therm	or	\$9.16/106 Btu (1 therm = 100,000 Btu)
Electricity	\$0.081/kwh	or	\$23.73/106 Btu (1 kwh = 3,413 Btu)
Coal	\$49.48/ton	or	\$2.22/106 Btu (1 lb. = 11,190 Btu)
Oil & Propane	\$1.19/gal	or	\$8.76/106 Btu (1 gal = 136,049 Btu)
Steam	\$14.70/1000 lb.	or	\$14.70/106 Btu (1 lb. steam = 1,000 Btu)

3 Corrections Natural Gas \$1.15/therm or \$11.53/106 Btu (1 therm = 100,000 Btu)

4 CMS expenditures and energy use contain data from multiple agencies.

➤ **Table A-8**

This table presents the expenditures on energy by the State for the Fiscal Year as reported in the respective Comptroller's Data Warehouse records. The same description and preparation methods as were used in Table 1 apply.

Table A-8

State of Illinois FY05 Building Energy Cost (\$)¹

Agency²	Natural Gas	Electricity	Coal	Fuel Oil	Purchased Steam	Total Building Energy Cost³	% of Total Building Energy Cost
Universities⁴	30,378,701	61,444,792	3,608,938	344,034	6,717,169	102,493,634	52.8
Corrections	13,522,657	16,174,588	451,151	166,977	***	30,315,373	15.6
Human Services	5,974,456	6,014,780	1,324,494	15,756	***	13,329,486	6.9
Central Management Services⁵	2,698,856	10,620,001	***	4,981	***	13,323,838	6.9
Transportation	1,527,139	9,275,052	***	136,102	***	10,938,293	5.6
Secretary of State	240,026	4,605,201	369,455	10,648	***	5,225,330	2.7
Illinois Tollway	803,848	2,478,100	***	4,493	***	3,286,441	1.7
Natural Resources	410,633	2,454,643	***	394,415	***	3,259,691	1.7
Military Affairs	1,580,416	1,505,727	***	113,157	***	3,199,300	1.6
State Police	452,356	1,433,126	***	24,561	***	1,910,043	1.0
All Others⁶	1,876,482	4,683,179	221,460	27,180	***	6,808,301	3.5
Total	\$59,465,570	\$120,689,189	\$5,975,498	\$1,242,304	\$6,717,169	\$194,089,730	100.0

¹ Based on FY05 Comptroller's Data Warehouse records. Natural Gas numbers based on account 1251; Electricity - 1252; Coal - 1341; Fuel Oil - 1342; and Purchased Steam - 1254. Expenditures by Public Aid from the LIHEAP funds are excluded.

² The agencies in this category expended approximately 1 percent of the State's total building energy costs.

³ Gasoline not included.

⁴ Based on FY05 data from Board of Higher Education.

⁵ CMS expenditures and energy use contain data from multiple agencies.

⁶ All remaining state agencies.

➤ **Table A-9**

This table shows the amounts of energy consumed, in millions of Btus, by the State, for the Fiscal Year, respectively. The same description and preparation methods as were used in generating Table 2 apply.

Table A-9

State of Illinois FY05 Building Energy Consumption (106 Btu)

Agency 1	Natural Gas	Electricity	Coal	Fuel Oil	Purchased Steam	Total Building Consumption	% of Total Building Consumption
Universities 2	4,072,212	2,641,651	2,455,060	34,335	456,950	9,660,208	52.8
Corrections 3	1,733,674	916,407	289,199	16,765	***	2,956,045	16.2
Human Services	744,017	340,781	849,035	1,582	***	1,935,415	10.6
Central Management Services 4	336,097	601,700	***	500	***	938,297	5.1
Transportation	190,179	525,499	***	13,665	***	729,343	4.0
Secretary of State	29,891	260,918	236,830	1,069	***	528,708	2.9
Illinois Tollway	100,106	140,402	***	451	***	240,959	1.3
Natural Resources	51,137	139,073	***	39,600	***	229,810	1.3
Military Affairs	196,814	85,310	***	11,361	***	293,485	1.6
State Police	56,333	81,197	***	2,466	***	139,996	0.8
All Others	233,684	265,336	141,962	2,729	***	643,711	3.5
Total	7,744,144	5,998,274	3,972,086	124,523	456,950	18,295,977	100.0

1 Energy consumption for all agencies, except Universities and

2 University unit costs:

Corrections, is based on adjusted average Human Services

FY05 unit energy costs as follows:

Natural Gas	\$0.803/therm	or	\$8.03/106 Btu (1 therm = 100,000 Btu)
Electricity	\$0.060/kwh	or	\$17.65/106 Btu (1 kwh = 3,413 Btu)
Coal	\$34.35/ton	or	\$1.56/106 Btu (1 lb. = 11,018 Btu)
Oil (#2)	\$1.38/gal	or	\$9.96/106 Btu (1 gal = 138,946 Btu)

Natural Gas	\$0.746/therm	or	\$7.46/106 Btu (1 therm = 100,000 Btu)
Electricity	\$0.079/kwh	or	\$23.26/106 Btu (1 kwh = 3,413 Btu)
Coal	\$33.00/ton	or	\$1.47/106 Btu (1 lb. = 11,190 Btu)
Oil & Propane	\$1.35/gal	or	\$10.02/106 Btu (1 gal = 134,407 Btu)
Steam	\$14.70/1000 lb.	or	\$14.70/106 Btu (1 lb. steam = 1,000 Btu)

3 Corrections Natural Gas \$0.780/therm or \$7.80/106 Btu (1 therm = 100,000 Btu)

4 CMS expenditures and energy use contain data from multiple agencies.

➤ **Table A-10**

This table presents the expenditures on energy by the State for the Fiscal Year as reported in the respective Comptroller's Data Warehouse records. The same description and preparation methods as were used in Table 1 apply.

Table A-10

State of Illinois FY04 Building Energy Cost (\$)¹

Agency ²	Natural Gas	Electricity	Coal	Fuel Oil	Purchased Steam	Total Building Energy Cost ³	% of Total Building Energy Cost
Universities⁴	29,527,303	49,561,763	3,175,515	418,465	6,636,996	89,320,042	49.8
Corrections	12,447,038	17,214,316	404,444	117,805	***	30,183,603	16.8
Human Services	6,035,623	8,938,367	1,084,472	15,700	***	16,074,162	9.0
Transportation	1,416,367	9,050,462	***	116,692	***	10,583,521	5.9
Secretary of State	203,757	5,221,428	386,987	2,208	***	5,814,380	3.2
Central Management Services	1,103,507	3,859,852	***	6,707	***	4,970,066	2.8
Illinois Tollway	802,946	2,423,795	***	7,771	***	3,234,512	1.8
Natural Resources	420,386	2,574,039	***	336,967	***	3,331,392	1.9
Military Affairs	1,369,111	1,535,840	***	88,561	***	2,993,512	1.7
State Police	415,299	1,488,112	***	23,714	***	1,927,125	1.1
Children and Family Services	204,759	1,301,644	***		***	1,506,403	0.8
All Others⁵	1,625,467	7,596,280	236,880	24,549	***	9,483,176	5.3
Total	\$55,571,563	\$110,765,898	\$5,288,298	\$1,159,139	\$6,636,996	\$179,421,894	100.0

¹ Based on FY04 Comptroller's Data Warehouse records. Natural Gas numbers based on account 1251; Electricity - 1252; Coal - 1341; Fuel Oil - 1342; and Purchased Steam - 1254.

² The agencies in this category expended approximately 1 percent of the State's total building energy costs.

³ Gasoline not included.

⁴ Based on FY04 data from Board of Higher Education.

⁵ All remaining state agencies.

Table A-11

This table shows the amounts of energy consumed, in millions of Btus, by the State, for the Fiscal Year, respectively. The same description and preparation methods as were used in generating Table 2 apply.

Table A-11**State of Illinois FY04 Building Energy Consumption (106 Btu)**

Agency 1	Natural Gas	Electricity	Coal	Fuel Oil	Purchased Steam	Total Building Consumption	% of Total Building Consumption
Universities 2	4,224,221	2,590,787	2,334,938	63,500	402,486	9,615,932	52.9
Corrections 3	1,796,109	929,499	282,828	18,581	***	3,027,017	16.7
Human Services	870,941	482,633	758,372	2,476	***	2,114,422	11.6
Transportation	204,382	488,686	***	18,406	***	711,474	3.9
Secretary of State	29,402	281,935	165,650	348	***	477,335	2.6
Central Management Services	159,236	208,415	***	1,058	***	368,709	2.0
Illinois Tollway	115,865	130,874	***	1,226	***	247,965	1.4
Natural Resources	60,662	138,987	***	53,149	***	252,798	1.4
Military Affairs	197,563	82,929	***	13,969	***	294,461	1.6
State Police	59,928	80,352	***	3,740	***	144,020	0.8
Children and Family Services	29,547	70,283	***	***	***	99,830	0.5
All Others	234,555	410,166	165,650	3,872	***	814,243	4.5
Total	7,982,411	5,895,546	3,707,438	180,325	402,486	18,168,206	100.0

1 Energy consumption for all agencies, except Universities and

2 University unit costs:

Corrections, is based on adjusted average Human Services

FY04 unit energy costs as follows:

Natural Gas	\$0.693/therm	or	\$6.93/106 Btu (1 therm = 100,000 Btu)
Electricity	\$0.065/kwh	or	\$19.13/106 Btu (1 kwh = 3,413 Btu)
Coal	\$29.81/ton	or	\$1.36/106 Btu (1 lb. = 10,943 Btu)
Oil & Propane	\$0.90/gal	or	\$6.59/106 Btu (1 gal = 135,856 Btu)
Steam	\$16.49/1000 lb.	or	\$16.49/106 Btu (1 lb. steam = 1,000 Btu)

3 Corrections Natural Gas \$0.693/therm or \$6.93/106 Btu (1 therm = 100,000 Btu)