APPENDIX 6

UIC'S GREENHOUSE GAS PROFILE (FY2005-2006)

GREENHOUSE GAS INVENTORY

for the

UNIVERSITY OF ILLINOIS AT CHICAGO

Prepared by
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CME 596
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1. Administrative Information

A greenhouse gas inventory was conducted for the University of Illinois at Chicago for the Chicago campus (east, west and south). The campus lies roughly between the Eisenhower Expressway to the north, the Dan Ryan Expressway to the east, Roosevelt Road to the south and Damen to the west (map in Figure 1). In 2007, the campus covers 242 acres and 117 buildings. This project was conducted by Cynthia Klein-Banai, Graduate Student in Environmental and Occupational Health Sciences, as part of an independent study course (CME596) directed by Prof. Tom Theis, Director, Institute of Environmental Science and Policy.

2. Definition of Goal and Scope

The goal of this project was to calculate a baseline level for greenhouse gas emissions for UIC for FY2004-2007. This baseline will be used for setting goals and monitoring progress as obligated by the Chancellor's signature on the University President's Climate Commitment. It may be used in the event that the university joins the Chicago Climate Exchange. Additionally, this baseline can be used to benchmark against other universities.

The World Business Council for Sustainable Development and the World Resource Institute (WBCSD/WRI) defined a set of accounting standards[1] that address the scope by which reporting entities can set boundaries. These standards are based on the source of emissions in order to prevent counting emissions or credits twice. The three scopes are described below:

- **Scope 1** –
- or materials, products, waste, and community members; and fugitive emissions.
- **Scope 2** - includes GHG emissions from imports (purchases) of electricity, heat or steam – generally those associated with the generation of imported sources of energy.
- **Scope 3** - includes all other indirect sources of GHG emissions that may result from the activities of the institution but occur from sources owned or controlled by another company, such as: business travel, outsourced activities and contracts, emissions from waste generated by the institution when the GHG emissions occur at a facility controlled by another company, e.g. methane emissions from landfilled waste, and the commuting habits of community members.

The University of Illinois operates two co-generation plants on campus. However, it also purchases electricity from the grid when the purchase price is less than what it costs the university to produce it. Therefore, this project included all of Scope 1 and Scope 2 emissions. The boundaries are depicted visually in Figure 2. In addition, data was obtained to calculate some of the Scope 3 emissions, specifically for commuting of faculty, students, and staff and for solid waste.

[1] WBCSD/WRI, http://www.wbcsd.org/web/publications/ghg-protocol.pdf Accessed 11/6/2007.

3. Methodology

a) Data Collection

Data was collected from numerous sources on campus over a period of approximately three months from September to November 2007. Table 1 shows the sources of the data.

Table 1: Sources of Data

Type of Data	Unit	Name/Title
Electricity, steam, co-generation plants	Utilities	Jeff Barrie, Visiting Director
Transportation (University Fleet)	Facilities Management	Angel Diaz, Assistant Director for Transportation
Numbers of students, faculty, and staff	Data Resources and Institutional Analysis (DRIA)	Julie Smith, Director Barbara Zusman, Assistant Director
Parking spaces rented and transit benefits	Parking	Wanda Perry, Director
Student residences	Campus Housing	Susan Teggatz, Senior Associate Director of Housing
U-Passes	Campus Auxiliary Services	Nikki Andrae, Campus U-Pass Coordinator
Solid waste and compost	Facilities Management	Pablo Acevedo, Associate Director
Refrigeration	Facilities Management	Pete Bianco, Heat Light and Power
Budget	Office of the Vice-Chancellor for Administrative Services	Phil Weiss, Assistant Vice Chancellor for Administrative Services
Square footage	Office of Facility Information Management	Shweta Chopra, Assistant Director

Electricity is purchased from Commonwealth Edison when it is less expensive to purchase than to generate the electricity in the Co-generation plants. Purchased electricity data was obtained from the invoices that Utilities pays. In order to provide the most accurate emissions, a custom mixture was used for the sources of electricity based on the Environmental Disclosure Information from Com-Ed for appropriate 12-month period.[2] Northeastern Illinois has a mixture of electricity sources that is quite different from the rest of the region, in that it is highly dependent on nuclear energy (as high as 88% in FY2006).

Natural gas and #2 fuel oil are utilized in the cogeneration plants to run the engines, turbines, boilers, heat recovery steam generators, and duct burners. Consumption data was provided by utilities for this purpose. This is the same data use to report to the Illinois Environmental Protection Agency (IEPA) for the annual Clean Air report, as required by the Title V permit. Since the data for 2007 calendar year had not yet been reviewed for reporting to the

[2] Illinois Commerce Commission Environmental Disclosure Statements, http://www.icc.illinois.gov/industry/publicutility/energy/electricity/EnvironmentalDisclosure.aspx accessed 11/17/07

IEPA, it was not available for this report. Therefore, only FY2005 and FY2006 data were complete.

The two cogeneration plants for the UIC campus are located one on the West campus and one on the East campus. They are schematically depicted in Figures 3 and 4. The East Campus plant can generate a total of 20.2 MWe with two Cooper Reciprocating Engine Generators. These start up with #2 oil and then run on natural gas. In addition, there are two Wartsila Reciprocating Engine Generators. The plant "cogenerates" high temperature hot water use three boilers that can generate up to 200 MMBtu/hr of hot water using natural gas or #6 fuel oil. The plant also produces chilled water for the East Campus buildings.

The West Campus plant can generate up to 37.2 MWe and 360,000 lb/hr steam. Electricity is generated with three Solar Taurus Turbines that have heat recovery through three exhaust gas Heat Recovery Steam Generators with supplemental duct burners. The three Wartsila Reciprocating Engine Generators that don't have heat recovery. These run on natural gas.

The university fleet consists of trucks, buses, ground vehicles, departmental cars and vans, rental cars, etc. Many of the buses used for shuttling students and staff around campus run on natural gas. Other vehicles utilize gas, diesel and biodiesel. All of these are dispensed at the Transportation Facility on campus. The newer vehicles can use E85 gas but a source is not available on campus. Most of the data used for the calculations was from the gasoline dispensed from the pumps at the Transportation Facility. However, the meter on the natural gas pump began to malfunction sometime in 2005 so some of the earlier data is based on natural gas purchased.

Data for numbers of part-time and full-time and summer school students, faculty and staff was obtained from DRIA. There are approximately 10,000 faculty and staff on the Chicago campus, with an additional 2000 that work in satellite areas. Only faculty and staff that are working on the Chicago campus were counted since the emissions were calculated only for the Chicago facility. However, the student enrollment was only provided for total UIC students.

The User Manual for the Clean Air Clean Planet Calculator[3] recommends using transportation survey data to estimate commuter habits in addition to parking data and data on where people are commuting from. To date a commuter transportation survey has not been conducted at UIC, which is primarily a commuter school. However, data was used from a variety of sources to make a first degree estimate.

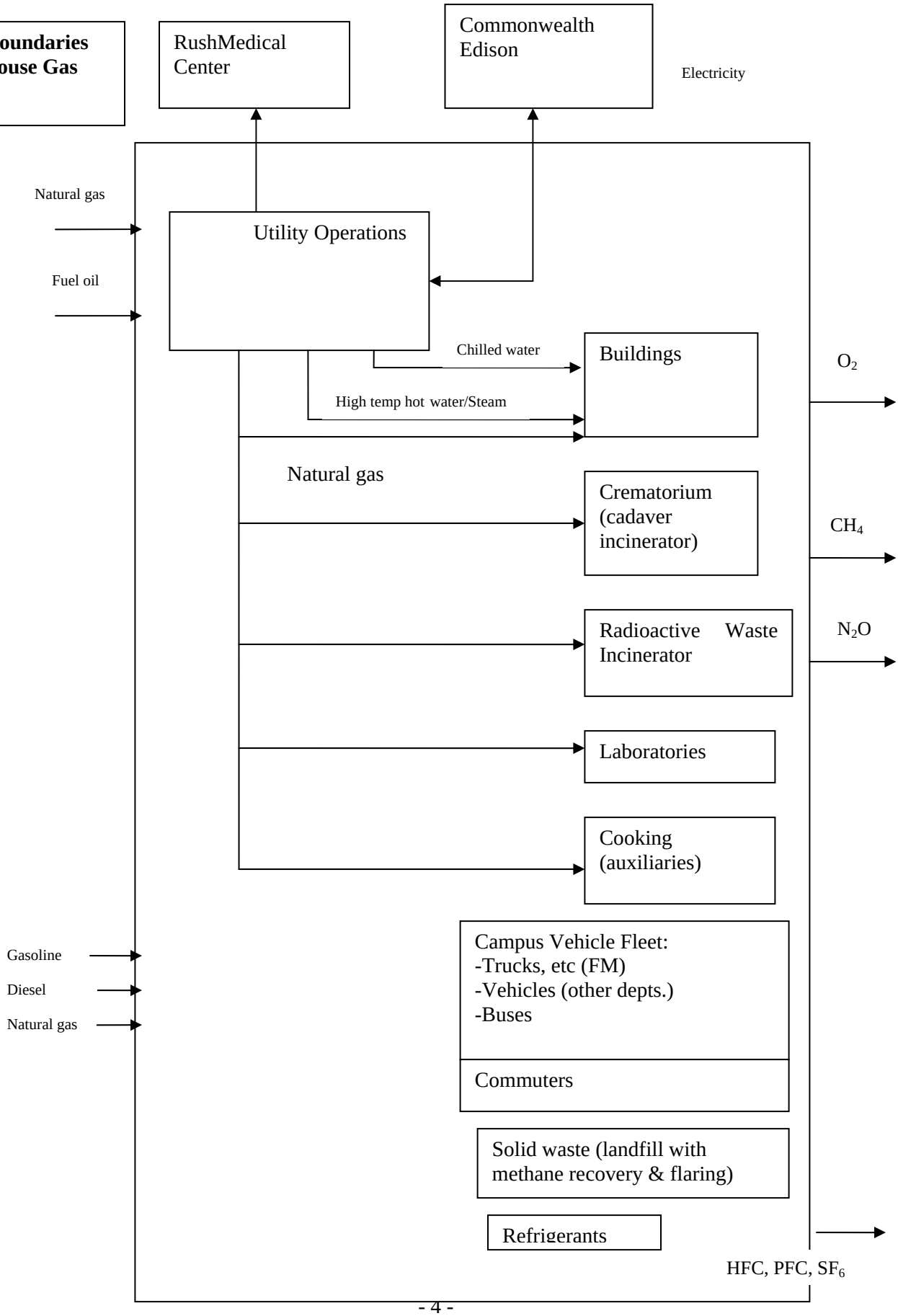
For students commuting calculations, a database was provided with zip codes for mailing and permanent addresses and university ID numbers (UIN). Calculations were performed using Mapquest[4] to calculate the distance between the east campus zip code (60707) and the students' mailing address zip codes. Based on this data, students traveled an average of 15 miles to campus for FY2005 and FY2006.

To determine the mode of transportation, several factors were taken into account. Almost all full-time students are eligible for U-Passes as part of the student fees they pay. U-Passes provide free transportation on the CTA trains and buses and on PACE buses. Additionally, data was obtained on the number of parking spaces rented by students, faculty and staff (Table 2). This data shows a decreasing amount of parking spaces rented overall. Also, 3064 students were living in residence halls during the period of analysis. Not all mailing addresses are believed to reflect the actual student residence. This was confirmed by the fact that less than 2000 students listed zip codes 60607 and 60612, where the residences halls are located as being their mailing addresses. From the parking data it was determined that between during FY2005-2007, 11-15% of the students rented parking spaces (Table 2).

Faculty and staff commuting was based on various data and assumptions. Based on zip code information for faculty and staff it was determined that the average commute for faculty is 13 miles one way and for support and academic staff it is 15 miles. From the parking data it was

[3] Clean Air Cool Planet Campus Carbon Calculator User's Guide, CA-CP Calculator v5.0, 2006.
[4] Mapquest Driving Directions, http://www.mapquest.com/directions Accessed 11/23/2007.

Figure 1: Boundaries for Greenhouse Gas Inventory



determined that between during FY2005-2007, between 74-67% of faculty staff rented parking spaces (Table 2). Of note, is that the number and percentage of spaces rented has decreased over the years. Faculty and staff that don't rent a parking space can utilize a pre-tax transit benefit to purchase tickets on public transportation (CTA, PACE and Metra). In FY08, 973 faculty and staff signed up for that benefit. Data for prior years was not provided so assumptions were based on this metric.

Figure 2 — **East Campus Cogeneration Plant**

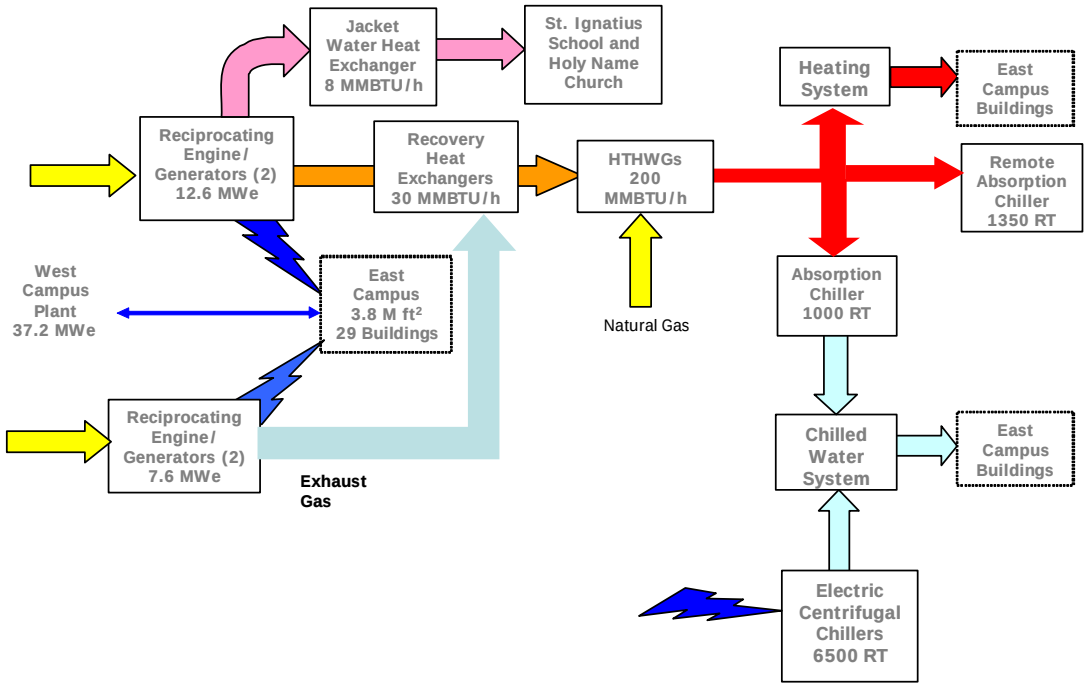


Figure 3 - West Campus Cogeneration Plant

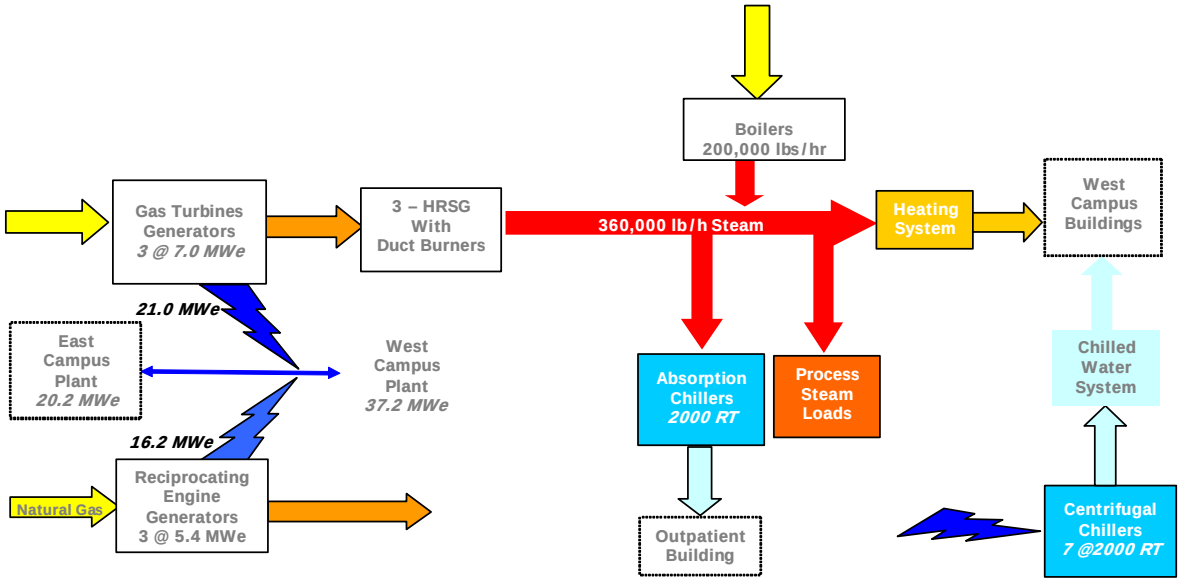


Table 2: Parking spaces rented by status

FY05	Students	Academic	Support staff	Nurses	Residents	Total Employees
West side	478	2111	1669	884	576	
East side	3268	1325	823			
Total	3746	3436	2492	884	576	7388
Percent	15%					74%
FY06						
West side	374	2087	1582	897	561	
East side	2794	1285	823			
Total	3168	3372	2405	897	561	7235
Percent	13%					70%
FY07						
West side	370	2105	1567	902	541	
East side	2208	1181	734			
Total	2578	3286	2301	902	541	7030
Percent	11%					67%

Using all of the zipcode, parking, residence hall, and transit benefit information, an estimation of the mode of transportation and the distance traveled by each mode was made. Also Bureau of Transportation statistics for 2006[5] were used that show that nationally 9% carpool to work and 3% bike or walk to work. These estimates are shown in Table 3.

Table 3: Estimated mode of transportation by status

	FY05		FY06		FY07	
	Students	Fac/staff	Students	Fac/staff	Students	Fac/staff
Driving	18%	75%	16%	71%	14%	67%
Carpooling	4%	7%	3%	6%	3%	6%
Metra	22%	5%	24%	7%	25%	9%
CTA	26%	8%	27%	11%	28%	13%
Bus	5%	2%	5%	2%	5%	2%
Bike/Walk	25%	3%	25%	3%	25%	3%
Total	100%	100%	100%	100%	100%	100%

UIC's solid waste is taken to Allied Waste's Loop Transfer Station. From there it mainly went to the Pontiac Landfill in the years studied. According to an employee of Allied Waste (Christine, tel: 815-844-3054), this landfill has methane recovery with flaring. Quantities of waste disposed and composted were provided by the UIC Transportation Department.

b) Calculations

The Campus Carbon Calculator v5.0 prepared by Clean Air-Cool Planet[6] was used to perform the calculations. This tool was developed in conjunction with numerous universities, particularly in the Northeast United States and is an upgrade of a tool used at more than 200 campuses in North America. It utilizes an electronic MS Excel workbook that calculates estimated GHG emissions from the data collected. It includes the six greenhouse gases defined by the Kyoto Protocol (CO_2, CH_4, N_2O, HFC and PFC, and SF_6). The calculations performed in the spreadsheets are based on workbooks prepared by the Intergovernmental Panel on Climate Change (IPCC, www.ipcc.ch) for national level inventories.

Emissions are calculated using the formula:

activity data x emissions factor = CO_2 emissions

Activity data is the quantification of an activity in units that can be combined with emission factors to obtain the resulting emissions. Examples include therms of natural gas, gallons of heating oil, kilowatt hours of electricity, miles traveled.[7] The data collection module includes the following major emissions sources: on-campus energy production; purchased electricity; natural gas service to buildings for laboratories and cooking (non co-gen); transportation (including air travel and commuting); waste; agriculture; and refrigerants.

Emissions from energy use are estimated from the quantity of fuel burned using national and regional average emissions factors, such as those provided by the US Department of Energy's

[5] Bureau of Transportation Statistics Table 1-38: Principal Means of Transportation to Work http://www.bts.gov/publications/national_transportation_statistics/2006/html/table_01_38.html accessed 11/17/2007

[6] Clean Air-Cool Planet Campus Action Toolkit, http://www.cleanair-coolplanet.org/for_campuses.php Accessed 11/6/07.

[7] Working 9 to 5 on Climate Change: An Office Guide, S.P. del Pino and P. Bhatia, World Resources Institute, December 2002, www.safeclimate.net

Energy Information Administration.[8] Transportation emissions utilized the Greenhouse Gases, Regulated Emissions, and Energy Use in Transportation (GREET) model developed at Argonne National Laboratory[9]. This model can be used to analyze vehicle fuel-cycles, commonly called well-to-wheels (WTW) analysis, for various fuel/vehicle systems. For a given transportation fuel/vehicle technology combination, GREET calculates the fuel-cycle energy consumption, greenhouse gas (GHG) emissions and emissions of five criteria pollutants. A regional composition for purchased electricity sources can be utilized or customized input can be used for electricity production.

4. Life Cycle Interpretation

a. Results

Tables 2 and 3 and their associated pie charts show the results of the GHG inventory by source and by gas, as well as the total in carbon dioxide equivalents in metric tons. For FY2005 the total emissions were 224,852 MTCDE (metric ton carbon dioxide equivalents) and for FY2006 they were 240,466 MTCDE. This shows an increase of 6% between the two years (Table 5).

The pie charts show that emissions from purchased electricity (7%) and waste disposal (<0%) showed no change in their relative contribution the GHG emissions. However, in 2006 as compared to 2005, there was an increase in contributions from co-generated electricity from 71% to 74%. On the other hand, there was a decrease from the transportation sources from 20% to 18% that can be attributed to lower commuter contributions to GHG emissions.

The results can be normalized by comparing the emissions and energy use to various demographics such as community size, budget, and building space. These results are shown in Table 6. There is an increase of all factors over the two years, with the smallest change (1%) being in carbon dioxide emissions when normalized to operating and research budgets. There is a large increase in emissions as compared to student and community size and total building size (6-7%). When these comparisons are made to energy use the increases are even greater. In comparison to the campus population and to total building area, energy use increased 11%.

[8] U.S. Energy Information Administration, http://www.eia.doe.gov/environment.html Accessed 12/4/07.

[9] http://www.eia.doe.gov/geography.html The Greenhouse Gases, Regulated Emissions, and Energy Use in Transportation (GREET) Model 1.5 Argonne National Laboratory, U.S. Department of Energy, Michael Wang, www.transportation.anl.gov:80/ttrdc/greet/index.html

Table 3: Summary information for FY2005 and a pie chart showing a breakdown of sources.

MODULE	Summary						
WORKSHEET	Overview of Annual Emissions						
UNIVERSITY	University of Illinois at Chicago						
Select Year -->	2005	Energy Consumption	CO_2	CH_4	N_2O	eCO_2	eCO_2
		MMBtu	kg	kg	kg	Short Tons	Metric Tonnes
Purchased Electricity		393,000	15,489,482	0	0	17,074	**15,490**
Stationary Sources		3,079,556	162,634,010	16,261	327	179,789	**163,105**
	Non Co-Gen	70,689	3,731,770	373	7	4,125	**3,743**
	Co-Gen Electric	3,001,659	158,521,593	15,850	318	175,243	**158,980**
	Co-Gen Steam	7,208	380,648	38	1	421	**382**
Transport Total		668,032	44,259,463	7,111	2,479	49,776	**45,157**
	University Fleet	18,334	1,243,981	212	62	1,397	**1,267**
	Student Commuters	326,876	20,645,668	2,614	937	23,130	**20,983**
	Faculty/Staff Commuters	322,822	22,369,814	4,285	1,479	25,249	**22,906**
Solid Waste		-	-	48,744	-	1,236	**1,121**
Total		**4,140,588**	**222,382,956**	**72,117**	**2,805**	**247,875**	**224,872**
Offsets						**(22)**	**(20)**
	Composting					**(22)**	(20)
Net Emissions						**247,853**	**224,852**

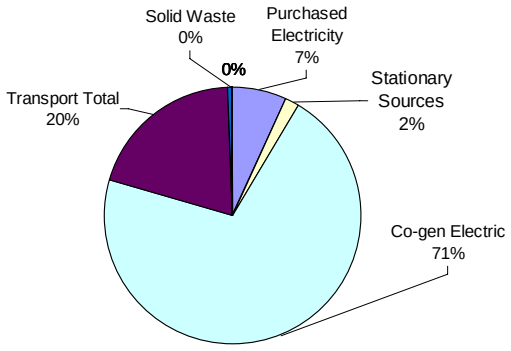


Table 4: Summary information for FY2005 and a pie chart showing a breakdown of sources.

MODULE	**Summary**						
WORKSHEET	**Overview of Annual Emissions**						
UNIVERSITY	**University of Illinois at Chicago**						
Select Year -->	**2006**	Energy Consumption	CO_2	CH_4	N_2O	eCO_2	eCO_2
		MMBtu	kg	kg	kg	Short Tons	Metric Tonnes
Purchased Electricity		602,021	16,067,978	6	12	17,716	**16,072**
Stationary Sources		3,396,888	179,456,629	17,954	362	198,387	**179,977**
	Non Co-Gen	54,825	2,894,288	289	6	3,200	**2,903**
	Co-Gen Electric	3,334,440	176,159,644	17,624	355	194,742	**176,670**
	Co-Gen Steam	7,622	402,697	40	1	445	**404**
Transport Total		658,212	42,406,521	6,865	2,387	47,697	**43,271**
	University Fleet	25,813	1,717,635	308	81	1,928	**1,749**
	Student Commuters	310,716	18,647,329	2,366	857	20,894	**18,955**
	Faculty/Staff Commuters	321,684	22,041,557	4,192	1,449	24,875	**22,567**
Solid Waste		-	-	51,155	-	1,297	**1,177**
Total		**4,657,120**	**237,931,128**	**75,979**	**2,761**	**265,097**	**240,496**
Offsets						**(33)**	**(30)**
	Composting					**(33)**	(30)
	Forest Preservation					-	-
Net Emissions						**265,064**	**240,466**

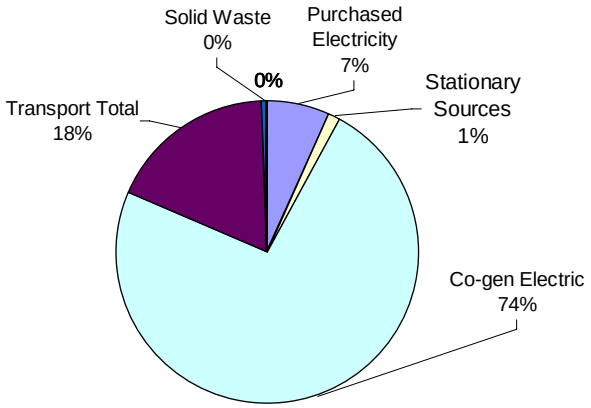


Table 5: Comparison of Carbon Dioxide Equivalents released over 2 years

		FY2005	FY2006	
		eCO2	eCO2	Change
		Metric Tonnes	Metric Tonnes	Percent
Purchased Electricity		**15,490**	**16,072**	**4%**
Purchased Steam/Chilled Water		**-**	**-**	
Stationary Sources		**163,105**	**179,977**	**9%**
	Non Co-Gen	**3,743**	**2,903**	**-22%**
	Co-Gen Electric	**158,980**	**176,670**	**10%**
	Co-Gen Steam	**382**	**404**	**5%**
Transport Total		**45,157**	**43,271**	**-4%**
	University Fleet	**1,267**	**1,749**	**28%**
	Student Commuters	**20,983**	**18,955**	**-11%**
	Faculty/Staff Commuters	**22,906**	**22,567**	**-2%**
	Air Travel	**-**	**-**	
Solid Waste		**1,121**	**1,177**	**5%**
Total		**224,872**	**240,496**	**6%**
Offsets		**(20)**	**(30)**	**34%**
	'Green' Electric Credits	-	-	
	Composting	(20)	(30)	**34%**
	Forest Preservation	-	-	
Net Emissions		**224,852**	**240,466**	**6%**

Table 6: Normalized comparison

Year	2005	2006	Change
Grams eCO2 / Operating budget $	164	165	1%
Kilograms eCO2 / Research budget $	0.91	0.92	1%
Kilograms eCO2 / Energy budget	6.08	6.24	3%
Metric Tonnes eCO2 / Student	10.23	11.01	7%
Metric Tonnes eCO2 / Community	6.96	7.47	7%
Kilograms eCO2 / Total Building Space	15.6	16.6	6%
Kilograms eCO2 / Research Building Space	249.3	258.9	4%
kBtu / Operating budget $	3.01	3.19	5%
kBtu / Research budget $	16.80	17.84	6%
kBtu / Energy budget $	154.3	161.4	4%
MMBtu / Student	188.3	213.2	12%
MMBtu / Community	128.1	144.7	11%
kBtu / Total Building Space	286.91	321.14	11%
kBtu / Research Building Space	4,590.72	5,012.55	8%

b. Assumptions and limitations

Several assumptions were made when making calculations using the Utility data. No account was made for steam provided to Rush University Hospital. This was considered part of UIC's emissions. The data is missing for natural gas consumption for cooking and laboratories. Although the assumption is that this usage is relatively small compared to the co-generation consumption.

Assumptions for commuting were discussed in the data collection section. Of particular note is that all commuting distances were to the east campus zip code of 60607 for simplicity. The two zip codes are approximately two miles apart. Other assumptions, not mentioned above were that full-time students and faculty and staff come to work 5 days/week. Staff commute 240 days/year, faculty commute 220 days/year, and during the school year students commute 155 days during the school year and 24 days during the summer session. It is assumed that this commuting occurs twice a day. When a university fleet vehicle is used for a long-distance trip and fuel may be purchased off-campus. Those purchases were not included in the calculations. In addition, there may be some inaccuracies due to the malfunction of the fuel dispenser meter for natural gas.

Several types of Scope 3 data were not included either due to difficulty obtaining the data or it was not relevant to UIC's activities. Air travel data was not included, as there was not a mechanism in place to collect the data at this time. No agricultural data was included because there are no agricultural operations on the urban UIC campus. Fertilizer data was not obtained, however due to budget restrictions very little or no fertilizer was used during the years studied. No refrigeration data was included since there were no releases in the co-generation plants during the years studied. Facilities Management does not keep records of refrigerant purchases and

losses for the small equipment that they repair. No data on the amounts of High Temperature Hot Water generated was provided, although the amount of natural gas used in those boilers was included.

c. Data quality assessment

Several campuses publish their GHG report on the internet. This data was used for comparison. This data is summarized in Table 7. The years and scope vary. The University of New Hampshire (UNH) reports that GHG emissions increased to 72,042 MTCDE in Fiscal Year 2004 (FY04) and then decreased to 68,324 MTCDE in Fiscal Year 2005 (FY05).[10] They predict they will further reduce emissions by 40% when their new co-generation plant is in full operation. UNH utilized the Clean Air Cool Planet calculator and their emissions include Scope 1, 2 and 3.

Harvard University accounts for Scope 1 direct emissions from on-campus combustion (steam plant, boilers, emergency generators) as well as Scope 2 indirect emissions that result from the operations of the university that are owned or operated by another company (purchased electricity, steam, or chilled water). Transportation is only accounted for in Harvard's Scope 3 emissions, including Harvard's own vehicles. Harvard uses a modified Clean Air Cool Plant calculator. Harvard's Scope 1 and Scope 2 GHG emissions for FY2006 were 317,260 MTCDE, a 1.2% increase since FY2005.[11] It should be noted that this is a university-wide calculation and includes several campuses.

Table 7: Comparison of UIC to other universities

University	UIC	UIC	UNH	UNH	Harvard	Tufts	Duke	Penn State	Yale
Year	2005	2006	2004	2005	2006	2005	2004	2002	2002
Metric tons eCO2	224,852	240,466	72,042	68,324	317,260	24,252	372,076	430,949	284,663
Metric Tonnes eCO2 / Student	10.23	11.01		5.5					
Metric Tonnes eCO2 / Community	6.96	7.47			8.8				12.6
Kilograms eCO2/ Total Building Space	15.6	16.6		14.5	14.8	3.58-10.78			22.5

Tufts University calculated 24,252 MTCDE, including a 851 credit, for Scope 1, 2 and 3 emissions. The ratio for total building space varies by campus: Boston campus 10.78; Medford campus 3.58; Graton (has Vet School) 5.23 sq ft. The scope does not include the small number of student commuters.[12]

Duke University[13] and Penn State[14] include Scope 1, 2 and 3 emissions. Yale University encompasses all three scopes, including air travel[15].

[10] 2004-2005 Update Greenhouse Gas Emissions Inventory, Office of Sustainability, University of New Hampshire, 2006.

[11] Harvard Green Campus Initiative, GHG Emssions http://www.greencampus.harvard.edu/ggi/total_emissions.php Accessed 11/27/07.

[12] Tufts Greenhouse Gas Emissions Inventory, http://www.tufts.edu/tie/tci/Inventory.htm Accessed 12/1/07.

[13] Duke University, Global Warming and Greenhouse Gas Emissions http://www.duke.edu/sustainability/ghg.html 12/1/07.

[14] A Greenhouse Gas Emissions Inventory and Projection for the University Park Campus of the Pennsylvania State University Executive Summary, Christopher Steuer, Pennsylvania State, May 10, 2004.

[15] Inventory and Analysis ofYale University's Greenhouse Gas Emissions, Yale Climate Initiative Team, http://environment.yale.edu/documents/downloads/v-z/wp_7_yale_ghg.pdf 12/1/07.

d. Conclusions and Recommendations

The College of Medicine Research Building (COMRB) was commissioned in the spring of 2005 and laboratory moves commenced in May 2005, with the majority of the moves completed by September 2005. Since laboratory buildings are the largest consumers of energy per square foot, it is likely that this factor was a major contributor to the increase in GHG emissions and energy consumption in FY2006, as compared to FY2007.

A major factor that effects energy consumption is the number of heating and cooling degree days. This should be examined for each year of study, in order to see if weather variations contributed to the increased energy demand.

Since the University began the co-generation operations in the late 1990's, it would be valuable to go back to a starting point of FY2000 and examine the Scope 1 and 2 emissions. Initially, more #2 oil was used and that may have had an effect on GHG emissions. Additionally, most of the data for FY2007 has already been compiled. When the Utility data is verified in early 2008 for the annual air emissions report, the calculations should be completed for FY2008.

In order to achieve more reliable commuting data, a mechanism should be set up to collect data for air travel and other reimbursed travel to off-campus conferences, meetings, and events. Finally, a commuter survey should be conducted to evaluate the accuracy of the assumptions made in this study.