



ENVIRONMENTAL MANAGEMENT DIVISION

MEMORANDUM

**TO:** Mayor Laurel Lunt Prussing and Members of the City Council  
**FROM:** William R. Gray, Public Works Director  
Rod Fletcher, Environmental Manager  
**DATE:** February 5, 2010  
**RE:** Sustainability Advisory Commission – Status Report

This is an informational memorandum providing a summary status report of activities that have occurred for and under the auspices of the Sustainability Advisory Commission (SAC) which convened its first meeting in September 2008.

First, it is important to distinguish between a Sustainability Plan and a Climate Action Plan (CAP). While the two are similar, they differ in scope and overall approach. Sustainability is not an end goal, but a continuing process that local governments can take to improve social equity, environmental, and economic conditions in their jurisdictions. A common framework to guide this effort is a sustainability plan, which aggregates a community's goals, strategies, implementation plans, and metrics for improving sustainability. Sustainability planning attempts do not only attain results in the short term – years, but also attempts to set forth a blueprint for the longer term – decades.

A Climate Action Plan primarily focuses on reducing Greenhouse Gases (GHG), including emissions resulting from both municipal operations and the community overall. A CAP can be viewed as a portion of the environmental component of a sustainability plan and has been the focus to date of SAC; given the urgency to reduce GHG's and affect climate change as has been stated by the International Panel on Climate Change (IPCC).

The city is a member of the International Council for Local Environmental Initiatives (ICLEI – Local Governments for Sustainability), is an international organization of local governments dedicated to addressing sustainability. Joining ICLEI and participating in their Cities for Climate Protection (CCP) Campaign has provided access to a comprehensive list of benefits ranging from technical assistance to software products to policy and practice manuals and public education scenarios. All of these supporting tools will be needed as the Commission moves forward to complete a CAP.

ICLEI has defined a simple, yet comprehensive 5 milestone process to create a CAP:

1. Conduct baseline emissions inventories and forecasts.
2. Adopt an emissions reduction target for the forecast year.

3. Develop a local action plan.
4. Implement policies and measures.
5. Monitor and verify results.

The following is a status report of process progress:

### **1. Conduct baseline emissions inventories and forecasts.**

Please find attached an initial draft of the community emissions inventory that will comprise a chapter in the Climate Action Plan. The baseline for the inventory is 2007 data and the results of the inventory indicate that the estimated GHG emissions amounted to 562,400 Metric Tons of Carbon Dioxide Equivalents (562,400 MTCO<sub>2e</sub>). There will be more data and additional narrative added in subsequent drafts. However, the results contained the inventory should be viewed as “final” and the inputs into the Clean Air and Climate Protection (CACP) software model is, to my knowledge, the best available at this time.

### **2. Adopt an emissions reduction target for the forecast year.**

Many communities that have adopted a climate action plan have set a long term goal of 80% reduction by 2050. Short term goals vary greatly. Chicago for example sets a goal of 25% by 2020, other examples are 13% by 2012 or 24% by 2012. Scientific research on climate change published since the 2007 assessment report from the International Panel on Climate Change (IPCC) is revealing that global warming is accelerating faster than anticipated, which would then require more aggressive changes in reduction targets.

SAC has adopted, and will be recommending a reduction goal of 25% to be attained by 2020 as the short term goal and target year. This means that reduction goals, strategies and action items to be identified in the CAP will attempt to attain this goal.

### **3. Reduction Strategies**

Staff is currently compiling reduction strategies for the various emission sectors – residential, commercial, industrial, transportation and waste to meet the short term goal. It is staff's intent to assemble a list of strategies from various sources such as those contained in other community CAP's, ICLEI, Smart Energy Design Assistance Center (SEDAC), and others.

In addition there are several salient items that have been completed:

1. Staff has also compiled water use data for 2007.
2. SAC has developed a vision statement and forwarded to Council and has been included in the Council Goals.
3. SAC has made specific recommendations to Council to advance sustainability, and again, many are contained in the Council Goals.

Finally, SAC will be hosting two public information forums at the Civic Center on February 24 and March 11, beginning at 7:00 p.m. The purpose of these forums is to present results of the community emissions inventory and engage the public and solicit their input so it can be included in the CAP. At this time, a draft of the CAP is anticipated to be available for Council review in late Summer.

**City of Urbana**

**Climate Action Plan**

**Chapter 2:**

**Greenhouse Gas Emissions Inventory**

(Initial Draft)

**November 2009**

Compiled by:  
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## Emissions Inventory

Think of this greenhouse gas (GHG) emissions inventory as an audit of the activities causing or releasing GHG's during a given period in time. The baseline year of this inventory is the calendar year of 2007. This inventory is organized by sector – residential, commercial, industrial, transportation and waste management; and presents emissions produced by these sectors. These inventories provide the basis for understanding and quantifying GHG emissions by sector and will enable the measurement of recommended reduction strategies that will be identified subsequent chapters in this Climate Action Plan (CAP) against the baseline.

A full analysis would also include projections of how much emissions are likely to increase over time within the City of Urbana's geographical area, and would include not only community wide data but also specifically detail emissions resulting from government facilities and operations. However this initial draft report presents overall community wide consumption data and emissions; for which governmental operations data are included and are a "subset" of overall community data. Typically governmental operations are a relatively small component of overall community wide data, less than 5 percent. An initial review of municipal consumption data, although not yet fully completed, affirms this and is approximately only 2%. Subsequent drafts will also include emission projections.

A typical community wide inventory includes the quantity of GHG's emitted within the corporate boundaries of the community as a whole. Although a portion of the University of Illinois operations and facilities are within the Urbana city limits, information that has been received by utilities excludes any energy that the University may consume. Since the University generates its own power and is also in the process of developing their inventory, energy consumption by the University is excluded from this inventory.

## Methodology

The Urbana Sustainability Advisory Commission (SAC) has been utilizing the International Council for Local Environmental Initiatives (ICLEI) – Local Governments for Sustainability, Five Milestone Process in developing the UCAP. This inventory has been prepared using ICLEI's Clean Air and Climate Protection (CACP) Software Model 2009, version 2.1 and was developed in cooperation with the National Association of Clean Air Agencies (NACAA) and is consistent with national and international standards and protocols established by the International Panel on Climate Change (IPCC) and the U.S. Voluntary Greenhouse Gas Reporting Guidelines (EIA form 1605).

This software estimates emissions using factors and coefficients that are specific to regional utility providers according to USEPA's "eGRID" emissions factors. It also determines emissions based on a variety of types of fuel used, i.e. diesel, gasoline, biodiesel, etc. The greenhouse gases carbon dioxide (CO<sub>2</sub>), nitrous oxide (N<sub>2</sub>O), and methane (CH<sub>4</sub>) are aggregated and reported as carbon dioxide equivalents (CO<sub>2</sub>e). *[There are many GHG's, but the aforementioned gases are the most common and prevalent. The IPCC developed the Global Warming Potential (GWP) to compare the ability of gases to trap heat in the atmosphere relative to another gas. The reference gas used is CO<sub>2</sub>; therefore all weighted emissions are measured in CO<sub>2</sub>e. For example, methane is 21 times*

more powerful than carbon dioxide in its ability to trap heat, so the model converts one ton of methane to 21 tons of CO<sub>2</sub>e. The GWP of Nitrous oxide is 310].

The software model, while sophisticated and a useful tool, depends upon assumptions and is limited by the quantity and quality of available data. Bearing this in mind, the numbers generated represent approximations and are not absolute.

### Inventory Inputs

Energy consumption data was obtained from Ameren Illinois for the residential, commercial, and industrial sectors. It was recognized that water usage and wastewater treatment by these sectors also involves the consumption of energy. In efforts to fully account for all energy and emissions, data was also obtained from Illinois American Water and the Urbana-Champaign Sanitary District (UCSD) which is located in Urbana. Chart 1 depicts adjustments that were made and the adjusted totals for natural gas and electricity are the actual input data into the CACP model.

Chart 1

	Residential	Commercial	Industrial	TOTAL
Natural Gas Therms	7,169,215	4,981,035	5,404,102	
UCSD Adj.	8,232	3,136	(11,368)	
Adj. Total	7,177,447	4,984,171	5,392,734	17,554,352
Electricity KWH	124,448,576	235,505,533	46,955,939	
UCSD Adj.	2,430,187	925,785	(3,555,972)	
Water Adj.	3,052,721	1,172,332	626,552	
Adj. Total	129,931,484	237,603,650	44,026,519	411,561,653

Figure 1

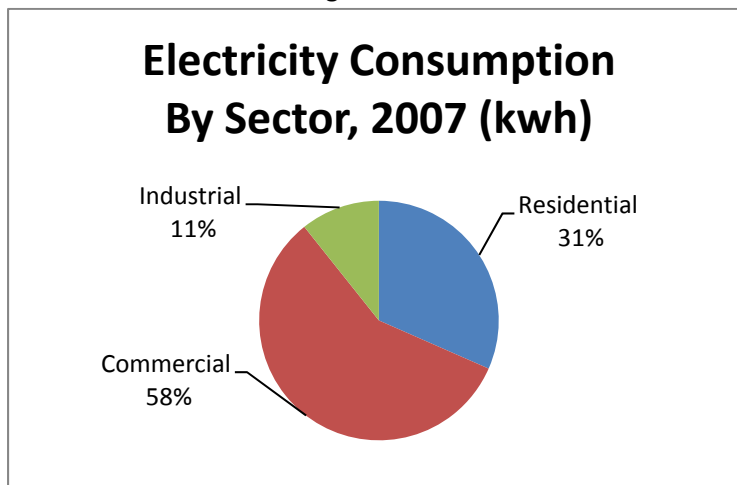
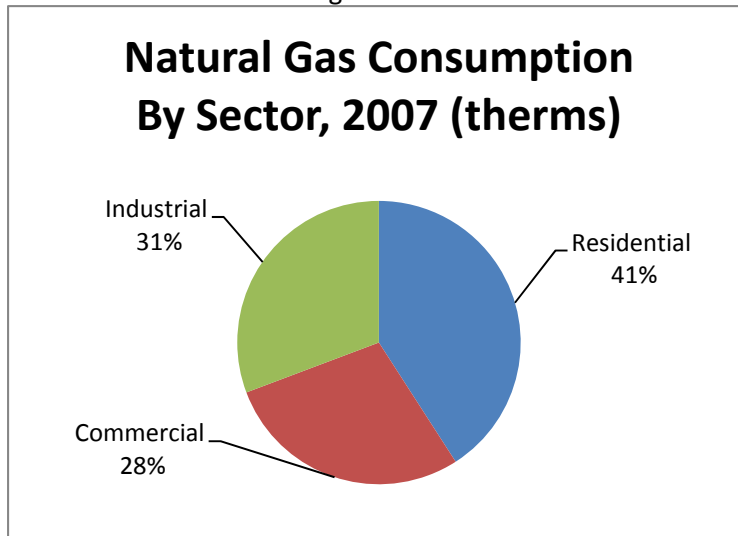


Figure 2



**Transportation Sector:**

Input data was obtained from the Champaign- Urbana Urbanized Area Transportation Study (CUUATS). Input units are Vehicle Miles Traveled (VMT), a value of 186,117,000 VMT is allocated to Urbana.

**Waste Management Sector:**

Input data for the quantity of waste disposed in a managed landfill is divided into 5 categories: paper products; food waste; plant debris; wood, furniture, textiles; and all other wastes. Total quantity of materials landfilled during 2007 was estimated at 39,673 tons.

Inventory Results

**Community Greenhouse Gas Emissions in 2007  
Summary Report**

	CO <sub>2</sub> (tonnes)	N <sub>2</sub> O (kg)	CH <sub>4</sub> (kg)	Equiv CO <sub>2</sub> (tonnes)	(%)	Energy (MMBtu)
<b>Residential</b>	145,966	1,869	4,835	146,647	26.1	1,161,197
<b>Commercial</b>	223,730	3,337	4,772	224,864	40.0	1,309,351
<b>Industrial</b>	65,169	663	962	65,395	11.6	689,535
<b>Transportation</b>	108,399	5,980	5,087	110,360	19.6	1,521,569
<b>Waste</b>	0	0	719,101	15,101	2.7	
<b>Total</b>	543,265	11,849	734,756	<b>562,368</b>	<b>100.0</b>	4,681,651

In 2007, greenhouse gas emissions generated from the City of Urbana was 562,400 Metric Tonnes of Carbon Dioxide Equivalents – 562,400 MTCO<sub>2</sub>e. The Commercial sector is the largest source of emissions at 40%, followed by the Residential sector at 26.1%, the Transportation sector at 19.6%, the Industrial sector at 11.6%, and the Waste sector at 2.7%.

Attached is a report from the CACP software that provides detail of emissions by sector.

**Community Greenhouse Gas Emissions in 2007**  
**Report by Source**

	<b>CO<sub>2</sub></b> <b>(tonnes)</b>	<b>N<sub>2</sub> O</b> <b>(kg)</b>	<b>CH<sub>4</sub></b> <b>(kg)</b>	<b>Equiv CO<sub>2</sub></b> <b>(tonnes)</b>	<b>(%)</b>	<b>Energy</b> <b>(MMBtu)</b>
<b>Residential Sector</b>						
Electricity	107,883	1,798	1,246	108,466	19.3	443,452
Natural Gas	38,084	72	3,589	38,181	6.8	717,745
<b>Subtotal</b>	<b>145,966</b>	<b>1,869</b>	<b>4,835</b>	<b>146,647</b>	<b>26.1</b>	<b>1,161,197</b>
<b>Commercial Sector</b>						
Electricity	197,284	3,287	2,279	198,350	35.3	810,934
Natural Gas	26,446	50	2,492	26,514	4.7	498,417
<b>Subtotal</b>	<b>223,730</b>	<b>3,337</b>	<b>4,772</b>	<b>224,864</b>	<b>40.0</b>	<b>1,309,351</b>
<b>Industrial Sector</b>						
Electricity	36,555	609	422	36,753	6.5	150,261
Natural Gas	28,614	54	539	28,642	5.1	539,273
<b>Subtotal</b>	<b>65,169</b>	<b>663</b>	<b>962</b>	<b>65,395</b>	<b>11.6</b>	<b>689,535</b>
<b>Transportation Sector</b>						
Diesel	17,742	52	54	17,760	3.2	242,549
Gasoline	90,657	5,928	5,033	92,600	16.5	1,279,020
<b>Subtotal</b>	<b>108,399</b>	<b>5,980</b>	<b>5,087</b>	<b>110,360</b>	<b>19.6</b>	<b>1,521,569</b>
<b>Waste Sector</b>						
Food Waste	0	0	232,325	4,879	0.9	
Paper Products	0	0	539,326	11,326	2.0	
Plant Debris	0	0	-2,766	-58	0.0	
Wood or Textiles	0	0	-49,784	-1,045	-0.2	
<b>Subtotal</b>	<b>0</b>	<b>0</b>	<b>719,101</b>	<b>15,101</b>	<b>2.7</b>	
<b>Total</b>	<b>543,265</b>	<b>11,849</b>	<b>734,756</b>	<b>562,368</b>	<b>100.0</b>	<b>4,681,651</b>