Cool Cities 2010 Progress Report



Background

Cool Cities Committee formed in 2007

- Focus on City Operations Only
- Collect Energy Use Data
- Establish Carbon Footprint Baseline (2001-06)
- Recommend Energy Reduction Goals
- Develop Implementation Plan

Goal to reduce carbon footprint 15% by 2014 (not including utilities)



Energy Sectors

Building Sector

Fleet Sector

Street Light Sector



Building Sector

Data Inputs

- Annual KwH Consumption of Electricity
- Annual Therms of Natural Gas
- Total Square Feet

Controls

- Building Square Footage Changes
- Degree Days (average daily temperature minus 65 degrees)



Building Sector Electrical Consumption





Building Sector Electrical Consumption

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	Adj. Six			
BUILDING SECTOR	Yr. Avg	<u>2007</u>	<u>2008</u>	<u>2009</u>
Airport	24.7	21.0	18.1	15.3
Animal Shelter	33.9	30.7	25.5	26.0
Cemetery	11.2	12.2	12.1	11.7
City Hall	2,110.2	1,894.8	1,910.5	2,049.9
CyRide	367.4	331.9	364.4	430.8
Electric Admin	66.2	69.5	70.5	72.0
Electric Distribution	342.7	333.8	321.1	330.6
Fire Station 1	182.5	120.1	104.1	116.9
Fire Station 2	57.9	50.2	48.3	51.7
Fire Station 3	86.1	82.1	89.5	84.1
Golf Course	21.5	22.2	20.0	21.0
Ice Arena	1,117.4	1,002.8	962.5	1,062.3
Information Services	29.7	24.2	22.4	24.0
Library	653.9	611.4	548.9	612.0
Maintenance Facility	177.6	120.8	190.9	190.8
Misc Sites	2.6	-	0.9	-
Parks - Adams Street House	0.2	1.2	1.5	1.0
Parks Maintenance	15.0	12.3	14.8	20.0
Parks Office	59.3	49.4	44.8	43.4
Totals	5360.1	4,790.5	4,770.8	5,163.6

Degree-Day Adjusted Electricity Used - KwH (x 1,000)



Building Sector Natural Gas Consumption





Building Sector Natural Gas Consumption

	Six-Yr			
BUILDING SECTOR	Avg	2007	<u>2008</u>	2009
Airport	0	0	0	0
Animal Shelter	3,737	3,462	3,168	2,812
Cemetery	1,810	1,448	1,703	1,615
City Hall	2,708	2,572	2,257	1,843
CyRide	0	0	0	0
Electric Admin	0	0	0	0
Electric Distribution	0	0	0	0
Fire Station 1	7,783	7,906	6,715	6,239
Fire Station 2	2,688	2,549	2,680	2,552
Fire Station 3	6,496	5,994	7,499	6,367
Golf Course	1,375	1,465	1,731	1,741
Ice Arena	25,468	25,322	25,610	25,912
Information Services	0	0	0	0
Library	8,594	8,802	8,739	7,826
Maintenance Facility	20,965	16,955	15,532	14,064
Misc Sites	0	0	0	0
Parks - Adams Street House	294	790	838	801
Parks Maintenance	1,576	1,795	1,892	1,762
Parks Office	2,987	1,842	<u>3,105</u>	2,940
Totals	86,481	80,901	81,469	76,476

Degree-Day Adjusted Nat. Gas Used - Therms



Building Sector CO2 Emissions

Adjusted City Building Sector CO2 Emissions 5,200 CO2 Emissions (tons) 5,000 4,925 4,800 4,600 4,695 4,417 4,406 4,400 4,200 2007 2008 2009 Year CO2 Emissions — — Baseline



Building Sector CO2 Emissions

CO2 Emissions (Tons), Adjusted by Sq. Ft, Degree Days					
	Six-Yr	r			
BUILDING SECTOR	Avg	<u>2007</u>	<u>2008</u>	<u>2009</u>	
Airport	20	17	15	13	
Animal Shelter	51	47	40	38	
Cemetery	20	19	21	20	
City Hall	1,745	1,565	1,577	1,687	
CyRide	301	272	298	352	
Electric Admin	54	57	57	59	
Electric Distribution	281	273	263	270	
Fire Station 1	198	147	126	134	
Fire Station 2	64	57	56	58	
Fire Station 3	111	104	119	109	
Golf Course	26	27	27	28	
Ice Arena	1,072	976	946	1,028	
Information Services	24	20	18	20	
Library	589	555	503	549	
Maintenance Facility	275	204	252	243	
Misc Sites	2	-	1	-	
Parks - Adams Street House	3	6	6	6	
Parks Maintenance	22	22	24	28	
Parks Office	67	51	56	53	
Totals	4,925	4,417	4,406	4,695	



Building Sector Carbon Footprint Reduction Summary

Building Sector Change Summary

	<u>2007</u>	<u>2008</u>	<u>2009</u>	Total
Electric Consumption Change (KwH x1,000)	-569.6	-589.3	-196.5	-1,355.4
% Electric Consumption Change	-10.6%	-11.0%	-3.7%	
Natural Gas Consumption Change (Therms)	-5,580	-5,012	-10,005	-20,597
% Natural Gas Consumption Change	-6.5%	-5.8%	-11.6%	
CO2 Change (Tons)	-508	-519	-230	-1,257
% CO2 Change	-10.3%	-10.5%	-4.7%	



Fleet Sector

Data Inputs

Annual Gallons of Fuel Burned

by <u>Type of Fuel</u>

by Type of Vehicle/Equipment

Annual Miles Driven

Controls

- Demand Changes
- Changing Fleet Makeup



Non-CyRide Fleet Sector Carbon Emissions





Non-CyRide Fleet Sector Carbon Emissions





Non-CyRide Fleet Sector Fuel Consumption

Increase in CO2

- More diesel usage
- Snow events: 2007-2009 had twice as many snowstorms as typical baseline year

Increase in Efficiency

2009: 22% increase in miles, only 16% increase in CO2

Increase in Low-Carbon Fuel Use

 2009: Replaced ~10,000 gals. of E10 with E85 (8x less tailpipe CO2)



CyRide Fleet Sector Carbon Emissions





CyRide Fleet Sector Carbon Emissions





CyRide Fleet Sector Fuel Consumption

Increase in CO2

More diesel usage: 300,000 gals. in 2009 vs. 250,000 gals. in 2002

Increase in Efficiency

2009: 15% increase in miles, only 10% increase in CO2

Increase in Ridership

- ISU Students fare free beginning in 2002
- 800,000 more riders in 2009 than in baseline years (20% increase)



Fleet Sector Carbon Footprint Reduction Summary

Fleet Sector Efficiency Change Summary

	<u>2007</u>	<u>2008</u>	<u>2009</u>	<u>Total</u>
Non-CyRide Fleet CO2 Change From Baseline (Tons)	133	261	281	675
% Non-CyRide Fleet Efficiency (Miles/Ton CO2) Change From Baseline	-16.2%	-13.0%	5.6%	
CyRide CO2 Change From Baseline (Tons)	277	213	318	808



Street Light Sector

Data Inputs

(Includes Traffic Signals, Streetlights, Sirens, Parks, & Pool)

- Annual KwH Consumed
- Number of Units in Service



Streetlight Sector Carbon Footprint





Streetlight Sector Carbon Footprint Reduction Summary

STREET LIGHT SECTOR	Six-Yr			
QTY OF UNITS IN SERVICE	Avg	<u>2007</u>	<u>2008</u>	<u>2009</u>
Sirens	17	15	15	15
Bookmobile Sites	5	5	5	5
Parks	24	25	25	25
Traffic Lights	81	94	94	94
Streetlights	5,899	6,211	6,211	6,211
Pools	1	1	1	1

STREET LIGHT SECTOR	Six-Yr			
CO2 (Tons)	Avg	<u>2007</u>	<u>2008</u>	<u>2009</u>
Sirens	0	0	0	0
Bookmobile Sites	1	1	1	1
Parks	124	156	159	151
Traffic Lights	379	225	201	184
Streetlights	3,241	3,364	3,481	3,492
Pools	<u>50</u>	<u>52</u>	<u>52</u>	<u>51</u>
Totals	3,795	3,798	3,894	3,879

84 Tons CO2 Increase (2009)

2.2% CO2 Increase (2009)



Carbon Footprint by Sector

Total CO2 Emissions by Sector (Tons) 5,500 5,000 **CO2 Emissions** 4,500 4,714 5,124 5,188 5,313 4,000 4,925 4,417 4,406 4,695 3,500 3,795 3,798 3,894 3,879 3,000 2,500 **Building Sector** Fleet Sector **Streetlight Sector** Sector ■ BASELINE ■ 2007 ■ 2008 ■ 2009



City of Ames - Operations Total Carbon Footprint





City of Ames - Operations Total Carbon Footprint

Decrease in Building Sector CO2

4.7% reduction in 2009

Increase in Fleet Sector CO2

- 22% more miles, 16% more CO2 in non-CyRide vehicles
- 15% more miles, 10% more CO2 in CyRide vehicles

Increase in Streetlight Sector CO2

- 2.2% increase due to more lights, parks
- Expect greater increase next year due to Furman Aquatic Center

Energy Reduction Strategies

- Continue to purchase more fuel efficient vehicles
- Change habits in building and vehicle usage
- Install energy efficient lighting in street, traffic, and park lights
- Use information from the City Building Energy Audit/Facility Assessment to allocate funds from the City Facilities Energy Improvements project. The CIP includes \$400,000 for projects such as:
 - Efficient lighting and occupancy sensors
 - Energy efficient HVAC systems and programmable thermostats
 - Optimization controls on large equipment



Questions ?

THANK YOU



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