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A Greenhouse Gas Baseline Calculation for the City of Fort Collins Natural Areas Program October 2009

Executive Summary

The City of Fort Collins formally recognizes that human-caused emissions of greenhouse gases are impacting the earth's climate system, causing the potential for unprecedented large-scale adverse health, social, economic and ecological effects. In 2008, Fort Collins City Council Resolution 2008-51 adopted the city's Climate Action Plan which targeted a 20% emission reduction of 2005 levels by 2020. That same year the City's Natural Areas Program (NAP) became interested in ways it could assist in supporting the City-wide emission reduction goals. Like most organizations, NAP recognizes the impacts of program operations related to greenhouse gas emissions.

In the summer of 2009 Natural Areas Program staff working in cooperation with the City's Climate Wise Program developed a draft greenhouse gas (GHG) baseline or "carbon footprint" for the city's Natural Areas Program. This project sought to identify components of the program's typical operations that contribute to GHG emissions and devise strategies to reduce the program's overall carbon footprint.

Background

The City of Fort Collins Natural Areas Program (NAP) manages 43 natural areas totaling nearly 34,000 acres from Masonville to the Wyoming border. Thirty permanent staff and 20 FTE hourly staff operate 10 facilities and a fleet of 27 vehicles. Typical management operations for the program include the maintenance of trails and public infrastructure, education programming, vegetation and wildlife management, and visitor services. At some level, each of these operations and services employ practices that produce GHG emissions.

Methodology

The Natural Areas Program GHG baseline was calculated using the Climate Wise methodology that aggregates program-wide energy, water, transportation (including fuels) and waste information into a customized spreadsheet to calculate emissions expressed as tons of CO_2e (carbon dioxide equivalent). The tool was developed using industry standard GHG coefficients (EPA and others) and is designed to maintain consistency with inventory methods applied in the City's Community GHG Inventory. Our baseline focused primarily on "Scope 1" emissions (direct GHG production) and "Scope 2" emissions related to the consumption of purchased energy. Activities outside the sphere of "typical day to day operations" were not included in this baseline inventory.

We compiled and examined all records from 2008 related to utility use, fuel use, vehicle miles traveled (VMT), volume of trash generated, and other consumptive use or practices that generate greenhouse gasses. Data were entered into the customized Climate Wise tool and summarized.

Findings

In 2008, typical operations of the Natural Areas Program resulted in the production of 267 tons of CO_2e. This is the equivalent to the emissions from 50 vehicles driving 12,000 miles per year or the energy used by 25 homes per year (EPA). Transportation (41.5%), utilities (44%), and solid waste production (14.5%) were the main categories that contributed to the NAP's carbon footprint. The table below provides a breakdown of those categories by type:

Category	Description	Approx. % of Baseline	Approx. % by Category
Transportation	Gasoline	33	**41.5%**
	Biodiesel	7	
	Fuel (propane)	1	
	Airline	0.5	
Utilities	Electricity	31	**44%**
	Natural gas	11	
	Propane	2	
Solid waste	Trash	14.5	**14.5%**

Conclusions

The Climate Wise Greenhouse Gas Baseline tool was useful in establishing an inventory and identifying key sources of carbon emissions for typical operations of the Natural Areas Program. This exercise identified key areas where the program will look to implement conservation measures to mitigate its carbon footprint. In addition to conservation, the program is examining one way to offset the footprint by purchasing carbon offsets in the voluntary carbon market. Under current (2009) market conditions, 267 tons of CO_2e valued at approximately $20/ton would cost the program $5,340. This and other reduction strategies are the basis of on-going discussions. The NAP has made a commitment to implement and exhaust all possible efficiency measures prior to considering the purchase of carbon offsets. The program's goal is to reduce operational GHG emissions by 20% from 2008 levels. In addition, the NAP is consulting with utility experts to evaluate the cost/payoff of placing solar panels at the Nix Facility (headquarters) to meet all electrical power needs.

Future efforts to calculate a programmatic GHG baseline for an open space program would need to consider how broad in scope (outside of typical operations) a carbon footprint should be calculated. Similar issues of future program growth, new (additive) responsibilities, and special one-time construction projects deserve further attention and contribute to the complexity of footprint calculations.

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Summary of All Natural Areas 2008 Input Data for GHG Baseline					
	unit	**Total Amounts**	**Annual Cost to NA Prog**	**Tons CO2e***	**% of GHG baseline**
Utilities					
Electricity	kWh	112,664	$ 11,569	96.16	30.5
Nat Gas	therms	5,612	$ 5,072	33.14	10.5
Propane	gal	468	$ 1,324	5.24	1.7
Water					
Non-Consumptive	gal	104,600	$ 423	0.05	0.0
Consumptive (irrigation using treated water)	gal	241,030	$ 980	0.49	0.2
Raw Water	gal	7,527,817	$ 2,656	0	0.0
Solid Waste					
Landfill	lbs	61,105		45.83	14.5
Recycling					
Cardboard	lbs	1,415		-2.02	
Steel	lbs	16,700		-16.45	
#1 & #2 Plastics	lbs	142		-0.12	
Mixed Office Paper	lbs	2,865		-4.81	
Food Waste	lbs	180		-0.02	
Yard Waste	$yards^3$	486		-21.38	
Commingled	lbs	1,792		-2.97	
Transportation					
Fuels – Fleet					
Unleaded	gal	10,271		106.35	33.8
Biodiesel (B20)	gal	2,620		21.71	6.9
Propane	gal	379		2.56	0.8
Airplane Mileage	miles	5,761		1.66	0.5
Mileage					
Mid-Size Vehicle (personal vehicle use reimbursement)	miles	128		0	0.0
Total				~267	100

* Negative values represent credits for recycling, etc.