

Non in Caucus Futuri:
Thinking Carbon Neutrality

October 26, 2007



Carbon Neutral

- **Part of Speech:** *adj*
- **Definition:** emitting no carbon dioxide into the atmosphere; also, employing a technique to absorb carbon dioxide so it is not emitted; also written [**carbon-neutral**], [**carbonneutral**]
- **Example:** Becoming carbon neutral is usually achieved by implementing renewable energy projects that offset the amount of carbon dioxide emissions, such as planting trees which absorb CO₂.
- **Etymology:** 1991
- **Usage:** carbon neutrality, n

Source: carbon neutral. (n.d.). *Webster's New Millennium™ Dictionary of English, Preview Edition (v 0.9.6)*. Retrieved May 09, 2007, from Dictionary.com website:
[http://dictionary.reference.com/browse/carbon neutral](http://dictionary.reference.com/browse/carbon%20neutral)

Toward Carbon Neutrality

1. Inventory
2. Reduce, employ new technology
3. Offset the rest

What is an inventory?

- Accounting of on and off site sources of fossilized carbon emissions
- Serves purpose generally larger than the inventory itself (i.e. environmental recordkeeping)
- General Equation

$$Q_{fi} \times Y_i = \text{MTCDE}_{fi}$$

Q_{fi} = Quantity of Fuel I

Y = Emissions factor of fuel I

MTCDE_{fi} = Metric tonnes of carbon dioxide equivalent generated by fuel I

Who has completed an inventory?

- Corporations: Walmart, BP, Mohawk
- Universities: Harvard, Middlebury, Duke, Bowdoin, University of Connecticut, University of Vermont
- Led by NE institutions

Methodology

- Cool Air- Clean Planet (data analysis)
- WRI (accounting standard)
- Individually developed (i.e. travel and transportation emissions)

Scope 1 (direct)

- All sources of emissions from processes directly owned and operated by the university
- Includes production of heat, transportation by university vehicles of materials, waste and people, and fugitive emissions of building cooling systems (i.e. refrigerants).

Scope 2 (indirect)

- Includes emissions from purchased electricity (Dominion Power)
- Factor determined by energy portfolio of on-grid provider

Scope 3 (indirect)

- All emissions from activities not included in the first two; indirect sources within the financial boundaries and not under direct control of university officers.
- Business travel, student and faculty commuting, methane emissions from landfilled waste and other outsourced activities (i.e. athletic team chartered buses)

Detailed Information Sources

1.1 Campus Heating and Steam Generation

1.2 University Vehicles

Stakeholders: Facilities Management, Auxiliary Services, Various Academic Departments with vehicles (Biology, Geology, Shepard Program)

1.3 Refrigerants

Stakeholders: Facilities Management, Office of the Architect

2.1 Purchased Electricity

Stakeholders: Facilities Management, Office of the Architect

3.1 Land filled Waste

Stakeholders: University Community

3.2 Business Travel

Stakeholders: Faculty and Administrators

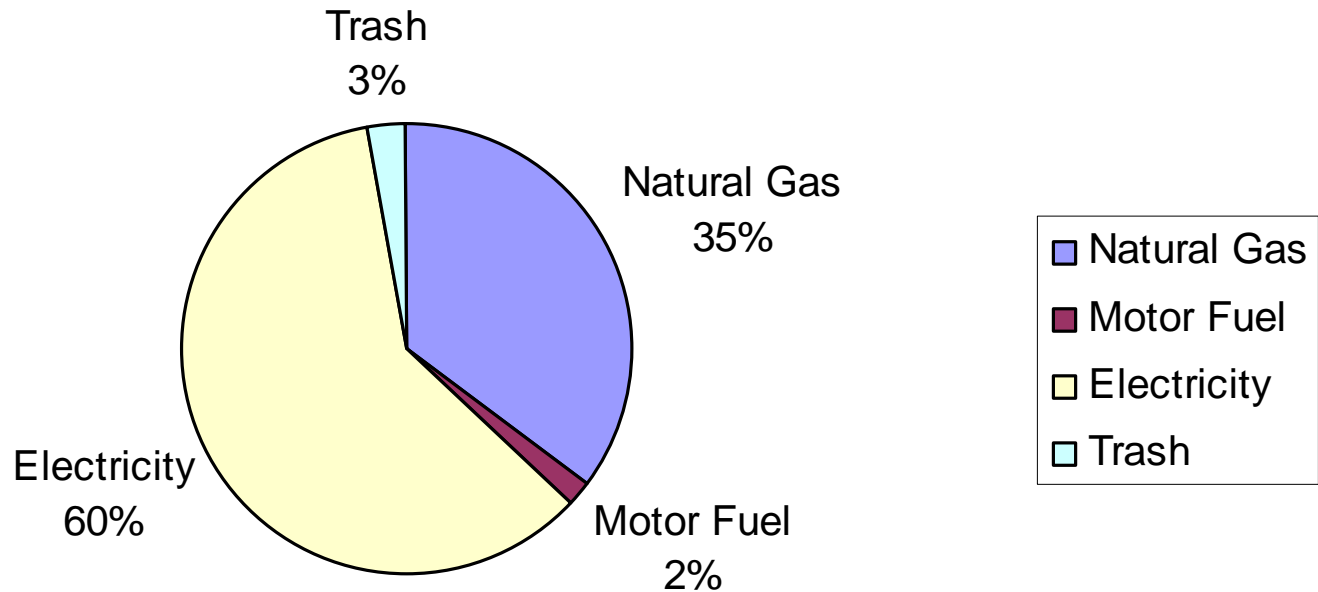
3.3 Student and Faculty Commuting

Stakeholders: Public Safety, Office of the Architect

3.4 Athletic Teams Bus Charters and Traveller

Stakeholders: Private Bus firms, Athletic Department

2006 CY Emissions



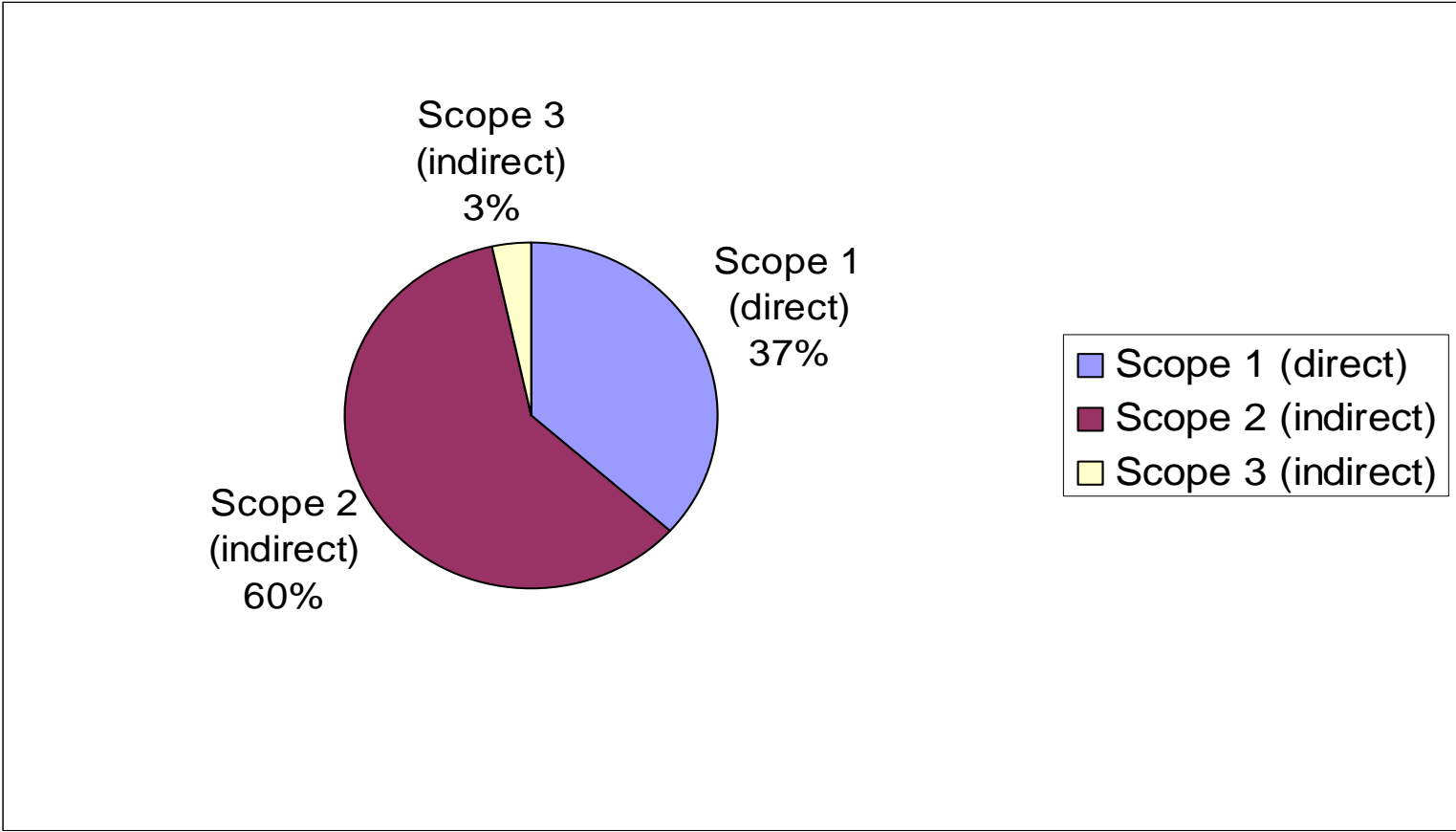
CY 2006 Emissions

<i>Fuel</i>		<i>Unit</i>		<i>GHG Factor</i>	<i>MTCO2e</i>
Natural Gas	169921.3222	MMBTU		0.053097506	9,022.40
Fuel Oil		none			0.00
Gasoline (FM)	28049.6	Gallons		0.009	252.45
Gasoline (Traveller)	1005.8741	Gallons		0.009	9.05
Diesel (FM)	1933.8	Gallons		0.01	19.34
Diesel (FM)	2182.9	Gallons		0.01	21.83
Diesel (Traveller)	2135.8	Gallons		0.01	21.36
Diesel (Athletic)	7787.184	Gallons		0.01	77.87
Electricity	26697781	Kwh		0.000575735	15,370.85
Water	5224452	gallons			0.00
Trash	729.74	short tons		0.99	722.44

Total MTCO2e

25,517.58

Emissions by Scope



Rethinking Carbon Neutrality

President's Climate Commitment

- GHG Inventory (every other year)
- Development of Emissions Reduction Plan (when and how to achieve neutrality) within 2 years

Environmental Policy at W&L

- Recycling
- Transportation
- Buildings and Grounds
- Auxiliary Services

Opportunities for Reduction

- Scope 1- Buildings and Transportation
- Scope 2- Electricity
- Scope 3- Outsourced Travel and Trash

What Emissions Are Avoided?

▶ **Emissions Reductions**
(metric tons of CO₂ equivalent):

- **Electricity: 1,051**

- **Natural Gas: 1,093**

Total Metric Tons: 2,144



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Offset your personal footprint

- Individual carbon credits
- Look for:
 - Transparency
 - Additionality
 - Generation of new production through job creation and implementing new technology
 - Redundancy

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- Linda Agnor
- Kelly Page
- Bryan Snyder
- Chris Wise
- Bill Hamilton
- Sarah Tilbor '08
- Woodrow Friend '08
- Brynn Chandler '07
- George Walker '08
- Whitney Dickson '07
- Kyle Wichser '07
- Drew Martin '09
- Jessica Huss '10
- James Kahn
- James Casey
- Bill Hamilton

HIGHER EDUCATION AND CLIMATE CHANGE

- Presidents Climate Commitment and Talloires Declaration
- Step It up, Cool Air Clean Planet, Focus the Nation, Power Shift

