

# Measuring Your Carbon Footprint

The Nuts & Bolts of Measuring (and Reducing) your  
Business's Greenhouse Gas Emissions



*Stowe, Vermont*

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# Who is Spring Hill?

Burlington, Vermont-based consulting company helping businesses and institutions throughout the Northeast with...

- **Energy and carbon management**
  - Comprehensive energy assessments, planning and reduction through conservation, efficiency, renewable energy, offsets
- **Clean energy**
  - Evaluation, planning, and implementing specific renewable energy and energy efficiency projects
- **Business sustainability**
  - Working with clients to define “sustainability” and helping them achieve sustainability goals

# Some clients



# Carbon management

Process of **measuring**, **mitigating**, and **monetizing** greenhouse gas (GHG) emissions (and other environmental impacts) across internal operations and supply chains. Benefits:

## Cost savings

- EPA: “Average” business can reduce energy use by 25-50%

## Brand enhancement

- Pew: 47 percent of Americans consider climate change a serious problem

## Preparation for regulation

- Cap and trade moving – smaller businesses on the horizon

## Operational efficiencies

- Daylighting = reduced energy usage & increased productivity

## Strategic planning

- Fuel price unpredictability

Right thing to do, climate leadership, company pride

# What is a carbon footprint?

Inventory of GHG emissions that includes:

- Heating fuels
  - Transportation fuels
  - Cooling system leaks
  - Chemicals
- Scope 1  
(Direct)
- Electricity
- Scope 2  
(Indirect)
- Solid waste
  - Employee commuting
  - Supply chain
  - Products
  - Etc.
- Scope 3  
(Indirect)



# A framework for measuring

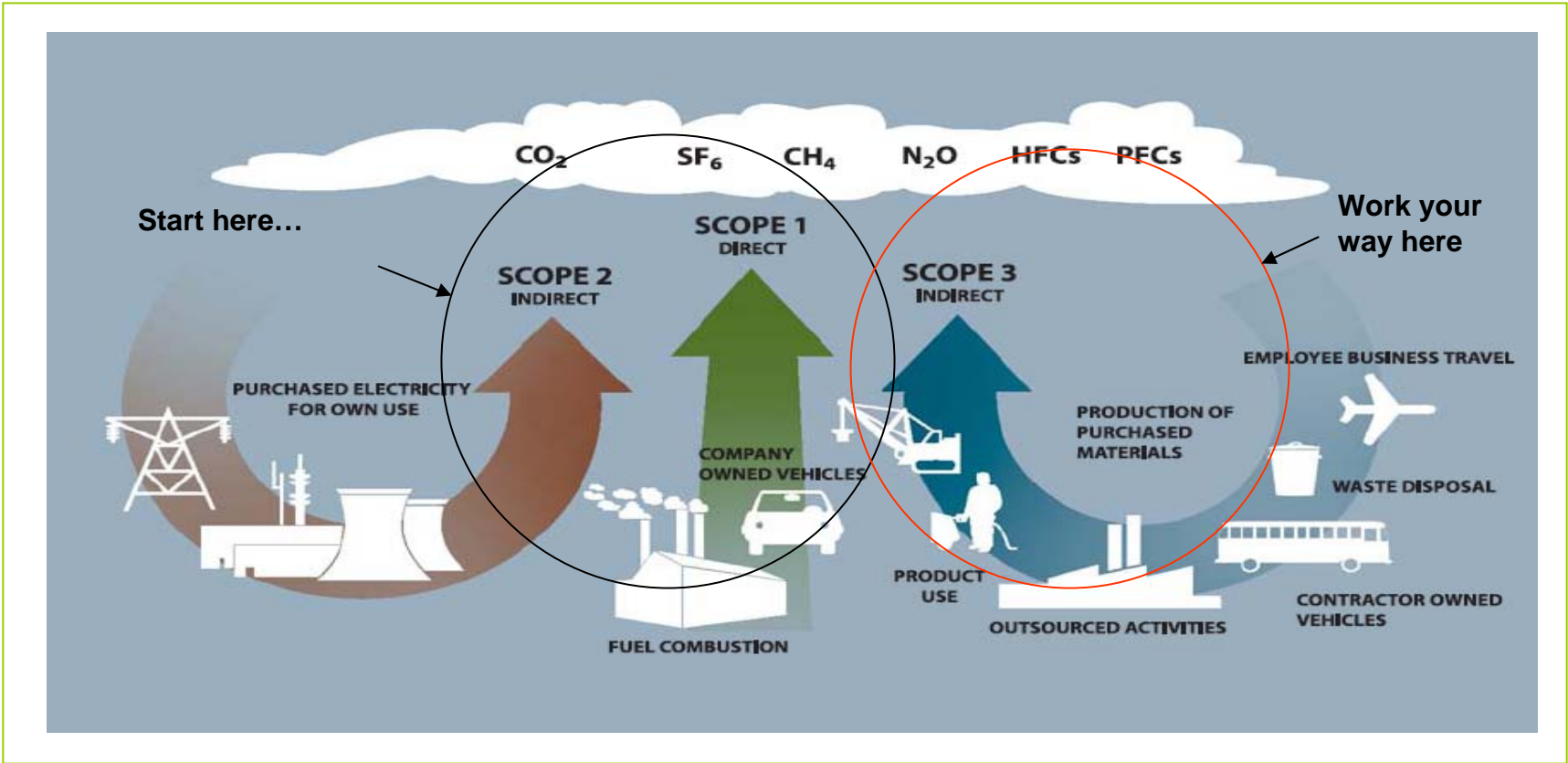


The Greenhouse Gas Protocol Initiative

*The foundation for sound and sustainable climate strategies*

- Greenhouse Gas Protocol:
  - Framework for nearly every GHG standard and program in the world, including the Climate Registry and the Chicago Climate Exchange.
- Three Key Decisions to Make:
  - What do we own/control?
  - How far out do we measure?
  - Base year

# Boundaries...



# Boundaries...

## Determining Higher Ground's Carbon Footprint: Categorizing Emissions

Scope 1: *Primary emission measurement from sources HG owns or controls*

**Building Energy**  
(natural gas)

**Refrigerants**

Scope 2: *Purchased energy (electricity)*

**Electricity**

Scope 3: *Not required by the GHG Protocol but important to assessing emissions that are not directly under HG's control*

**Customer Travel**  
(to and from HG)

**Staff Travel**  
(for HG business)

**Solid Waste**

*Potential future Scope 3 emissions for assessment: Artist travel, alternate HG facility emissions, emissions from water supply and waste water*

# Calculating Your Footprint

## Calculation Step

## Example

Step 1: Find in-house allies



Facilities staff, financial staff, utilities, HR, surveys

Step 2: Gather usage data (i.e., kWh, gallons, miles, etc.)



5,000 gallons of #2 heating oil used in 2008

Step 3: Identify emissions coefficients (sources include GHG Protocol, WRI, EIA)



10.21 kgCO<sub>2</sub>e/gallon

Step 4: Do the math

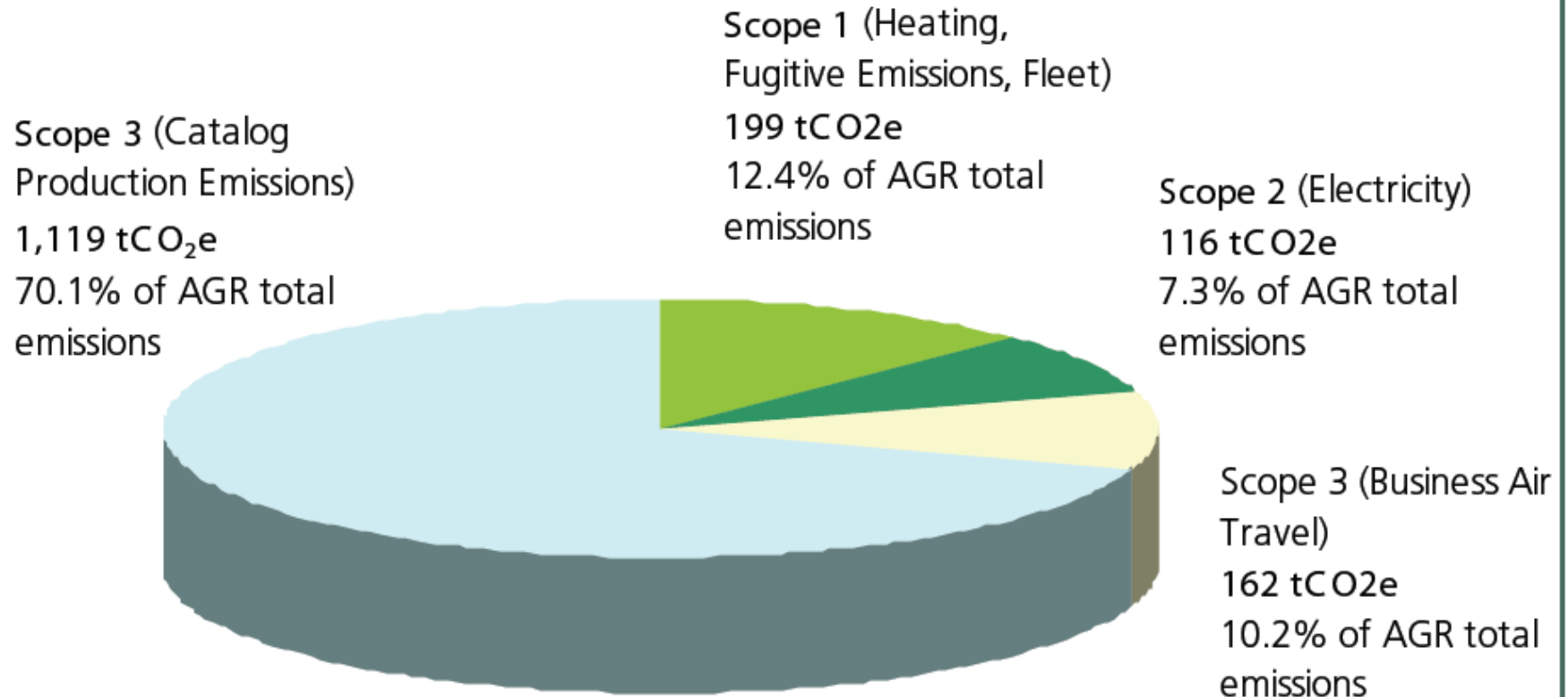


5,000 gallons x 10.21 kgCO<sub>2</sub>e/gallon = 51.1 tons CO<sub>2</sub>e

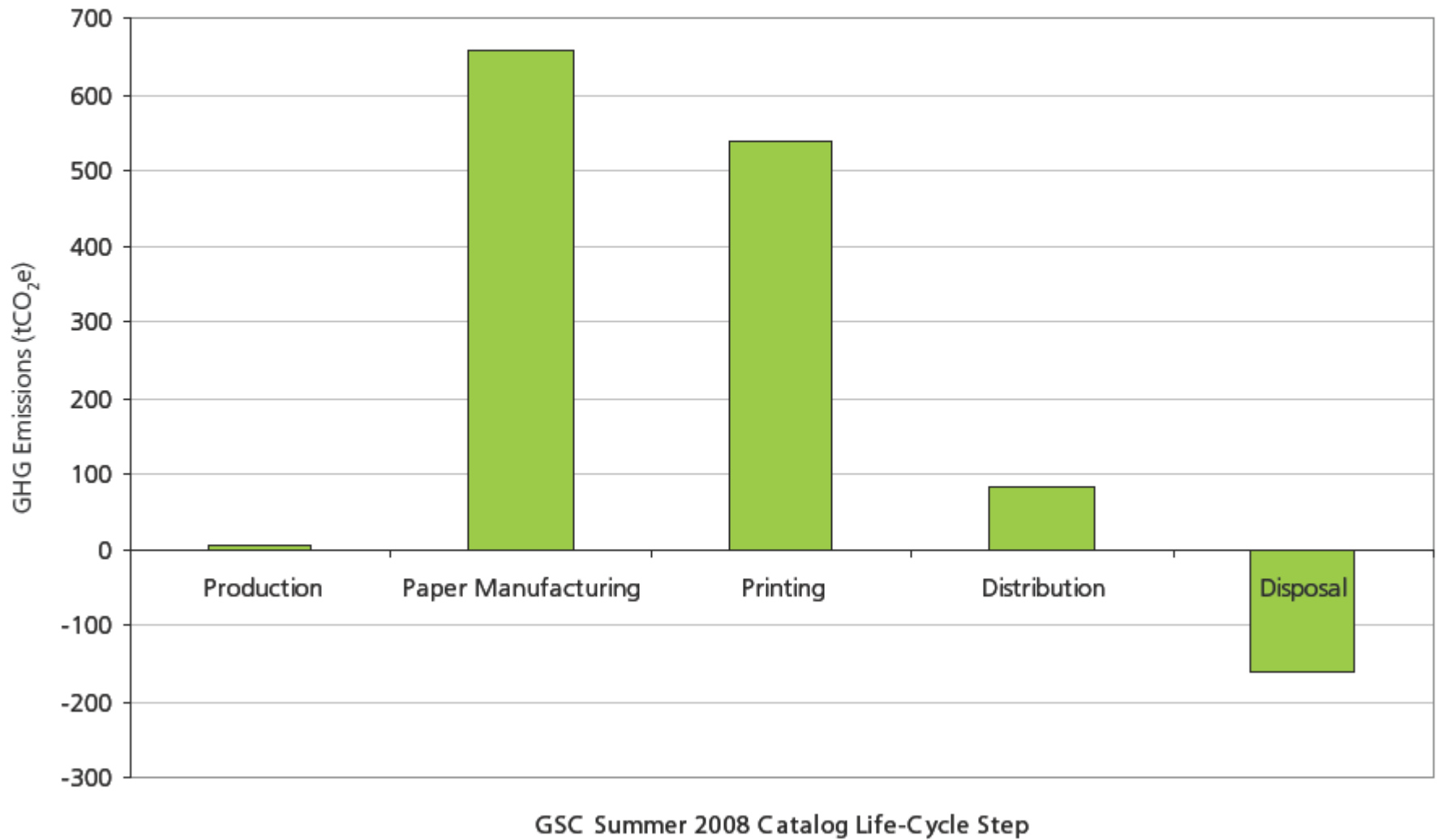
Step 5: Report it



## AGR TOTAL ASSESSED SCOPE 1, SCOPE 2, & SCOPE 3 GHG EMISSIONS



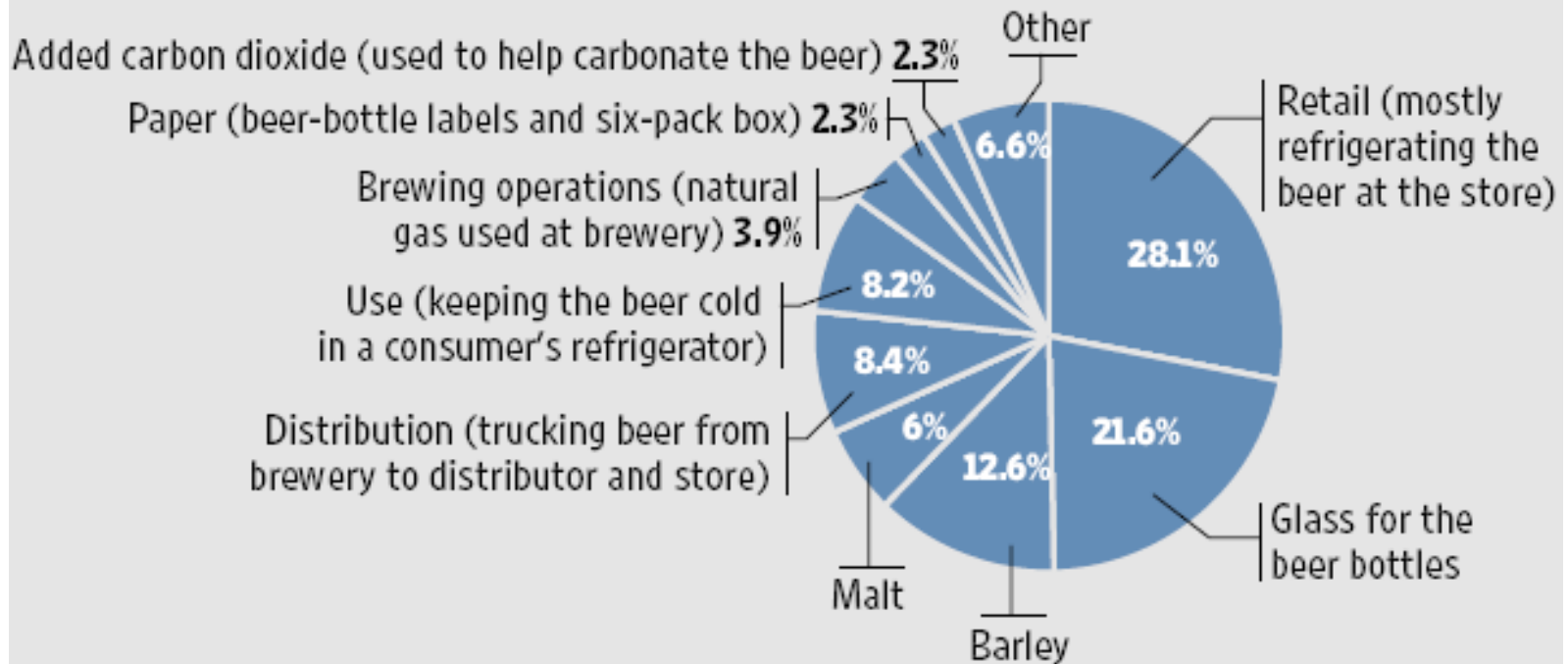
# PROJECTED GHG LIFE-CYCLE EMISSIONS GENERATED BY THE GSC SUMMER 2008 CATALOG



# Product-level footprints

## SIX-PACK OF BEER Fat Tire Amber Ale

TOTAL FOOTPRINT: 7 pounds



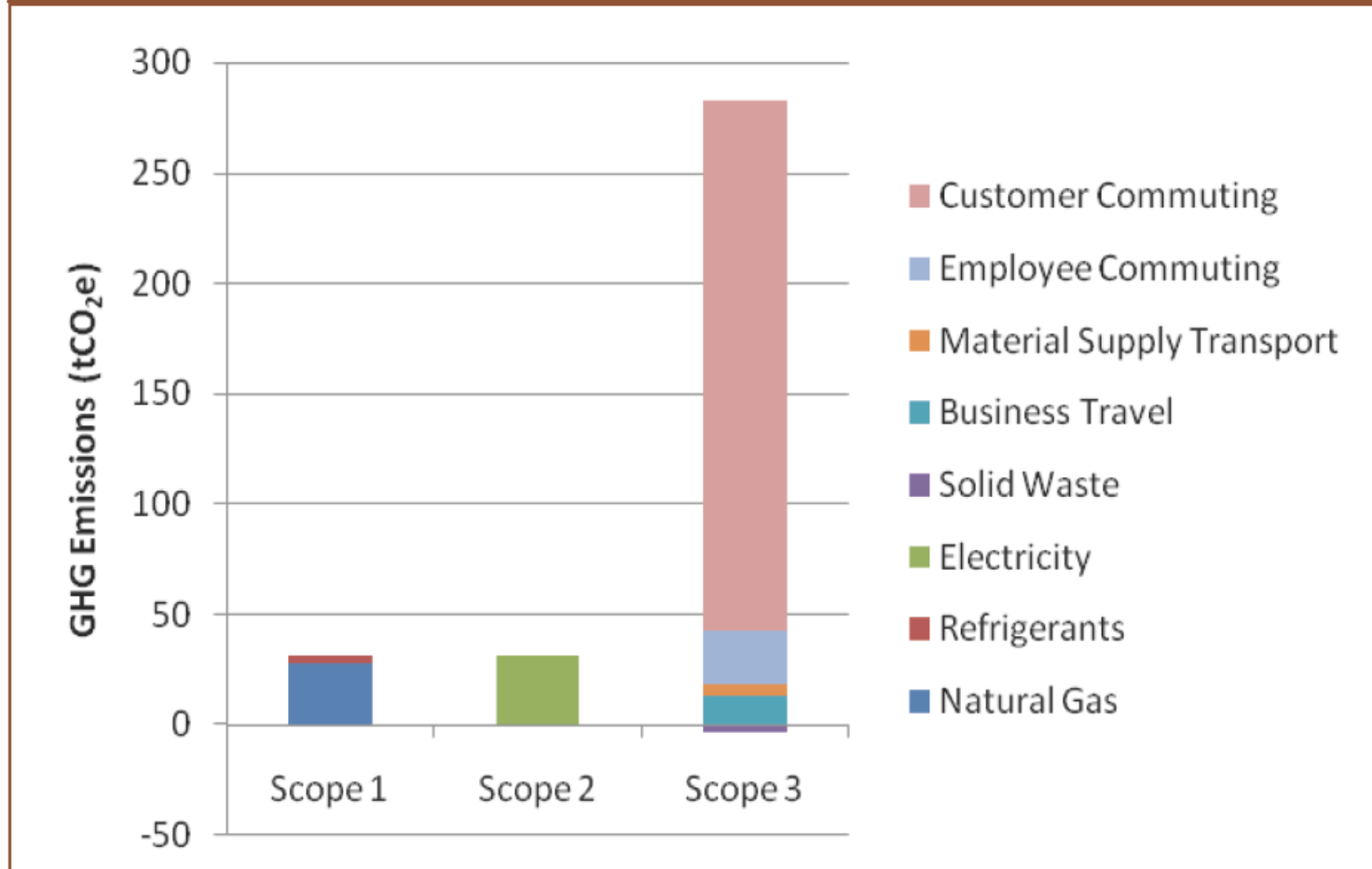
# Example footprint

**TABLE 1: AFBH TOTAL ASSESSED GHG EMISSIONS (MAY 2007 - DECEMBER 2007)**

Scope	Emissions (tCO <sub>2</sub> e)	Source(s)	Contribution to Total	
			Tons (tCO <sub>2</sub> e)	% of Total
Scope 1	31.1	Facility heating	28.0	8.0%
		Fugitive emissions from cooling and refrigeration equipment	3.1	1.0%
Scope 2	31.8	Facility electricity usage	31.8	9.0%
Scope 3	279.2	Solid waste disposal	-3.6	-1.0%
		Business air travel	12.9	3.8%
		Material supply transport	5.6	1.6%
		Employee commuting	24.2	7.1%
		Customer commuting	240.1	70.2%
<b>Total</b>	<b>342.1</b>			

# Example footprint

FIGURE 2: AFBH TOTAL ASSESSED SCOPE 1, 2, AND 3 GHG EMISSIONS



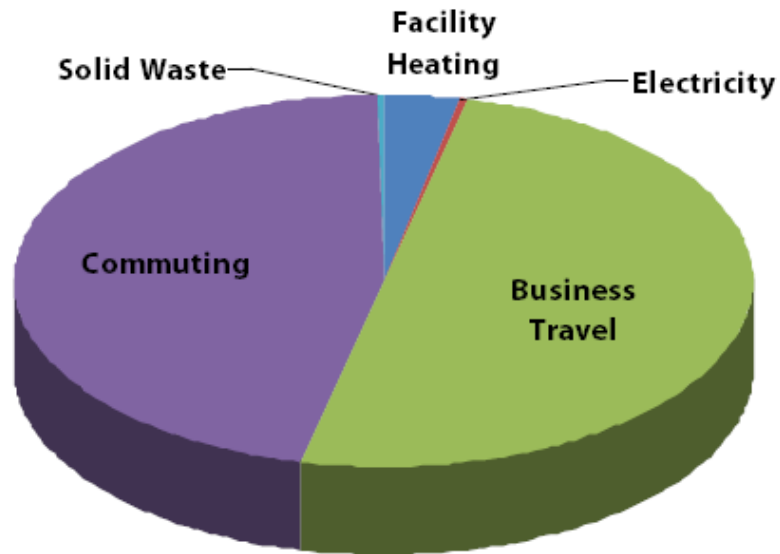
# Example footprint

**TABLE 1: TOTAL ASSESSED 2008 WMAP GHG EMISSIONS AND SOURCES**

Sector	Emissions (tCO <sub>2</sub> e)	Source(s)	Contribution to Total
Building Operations	<b>2.5</b>	Facility Heating	3.5%
	<b>.20</b>	Electricity	.3%
Transportation	<b>35.4</b>	Business Travel	49.8%
	<b>32.9</b>	Employee Commuting	46.3%
Waste	<b>.1</b>	Solid Waste Disposal	.2%
<b>Total</b>	<b>71.2 tCO<sub>2</sub>e</b>		<b>100%</b>

# Example footprint

FIGURE 1: 2008 WMAP EMISSIONS BY SOURCE



# Carbon reduction roadmap

## Sources

Heating fuels  
Transportation fuels  
Cooling system leaks  
Process emissions

Electricity

Solid waste  
Employee commuting  
Supply chain  
Products  
Etc.



## Solutions

### Conservation

- "Turn-off" campaigns
- Waste reduction initiatives
- Cultural awareness

### Energy efficiency

- Lighting upgrades
- Heating/cooling upgrades
- Alternative transportation

### On-site renewable energy

- Solar thermal and electric
- Biomass energy

### Purchased renewable energy

- Utility-provided renewable energy

### Carbon offsets

- Reducing emissions indirectly

# Tools and Resources

Greenhouse Gas Protocol / World Resources Institute

[www.ghgprotocol.org](http://www.ghgprotocol.org)

U.S. Energy Information Administration

[www.eia.doe.gov](http://www.eia.doe.gov)

U.S. Environmental Protection

[www.epa.gov](http://www.epa.gov)

International Energy Agency Data Services

<http://data.iea.org>

# A final word

Business is the most influential institution on the planet – through its values and practices it has the power to change the world...



# Thank you

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