



Measuring Your University's Carbon Footprint

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What Is a Carbon Footprint?

- Carbon dioxide and other GHG emissions for which institution is directly responsible
- Carbon or Greenhouse Gas Emissions Inventory
- Important first step in reducing carbon emissions



Tips For Getting Started

- Define scope of inventory
 - What to include/exclude
- Establish a baseline year
- Keep a detailed contacts log!



Establishing UT's Carbon Footprint

- ACUPCC
 - Deadline: September 15, 2008
- Tool: Clean Air-Cool Planet Campus Carbon Calculator
 - Contains all emissions factors: input data, 1990-present
 - Contains tools for projecting carbon reductions from various projects



Campus Carbon Calculator

- 3 scopes of emissions:
 - Direct sources
 - On-campus production of heat, steam, electricity
 - Transportation of products, fleet
 - Fugitive emissions (leaks)
 - Imported sources
 - Purchased electricity, heat, and steam
 - All other indirect sources
 - Commuters
 - Methane emissions from landfilled waste
- 8 categories of data

Source: Clean Air-Cool Planet Climate Action Toolkit:
www.cleanair-coolplanet.org/toolkit



I. Institutional Data

- For comparing results with other schools
- Budget (adjusted for inflation)
 - Source: Office of Vice Chancellor of Finance and Administration; UT Budget Document
 - Total Educational and General (Restricted and Unrestricted) Expenditures [Knoxville campus]
- Population
 - Students (part time, full time, summer), Faculty, Staff
 - UT: Office of Institutional Research Fact Book

Source: Clean Air-Cool Planet Climate Action Toolkit:
www.cleanair-coolplanet.org/toolkit



Institutional Data Continued...

- Physical size
 - Strategic Planning and Operations Office
 - Building space, research building space
- Limitations: Consistency

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II. Purchased Electricity

- Measured in kWh
- Also includes purchased steam and chilled water
- Often the largest contributor of emissions (generated from coal)
- Source: Facilities Services

Source: Clean Air-Cool Planet Climate Action Toolkit:
www.cleanair-coolplanet.org/toolkit



III. On-Campus Stationary Sources

- On-campus co-generation plant
 - Includes amounts of oil, natural gas, propane, and coal used for steam and electrical output
- Other stationary sources
 - Used for heating, cooling, labs
- Source: Facilities Services

Source: Clean Air-Cool Planet Climate Action Toolkit:
www.cleanair-coolplanet.org/toolkit



IV. Transportation

- 3 components:
 - University vehicles
 - Gasoline, diesel, natural gas, and electric fleet
 - Source: Transportation Services, Facilities Services
 - Commuter travel
 - Daily commute
 - Source: Smart Trips Travel Behavior Survey [2004]

Source: Clean Air-Cool Planet Climate Action Toolkit:
www.cleanair-coolplanet.org/toolkit



Transportation Continued...

- Air travel—optional for this model but extremely important
 - Faculty/staff business, and student programs
 - May not be kept track of by university

Source: Clean Air-Cool Planet Climate Action Toolkit:
www.cleanair-coolplanet.org/toolkit



V. Agriculture

- Fertilizer application
 - Tons per year
 - Synthetic and organic
- Animal agriculture
- Source: Facilities Services, College of Agriculture and Natural Resources

Source: Clean Air-Cool Planet Climate Action Toolkit:
www.cleanair-coolplanet.org/toolkit



VI. Solid Waste

- Incinerated waste
- Landfilled waste
 - No methane recovery
 - Methane recovery with flaring
 - Methane recovery with electrical generation
- Source: Facilities Services; contact landfill
- Limitations: CCC does not include recycling (EPA WARM Calculator); pre-1992 data

Source: Clean Air-Cool Planet Climate Action Toolkit:
www.cleanair-coolplanet.org/toolkit



VII. Refrigeration and Other Chemicals

- Many refrigerants such as HFCs have global warming potentials thousands of times that of carbon dioxide (GWP=1)
- Includes refrigeration chemicals in new fixtures as well as leaks
- Limitation: Can be extremely difficult to measure amounts lost to leakages

Source: Clean Air-Cool Planet Climate Action Toolkit:
www.cleanair-coolplanet.org/toolkit

VIII. Offsets

- Renewable Energy Credits (RECs)
 - Green Power Switch
- Composting
- Forest Preservation



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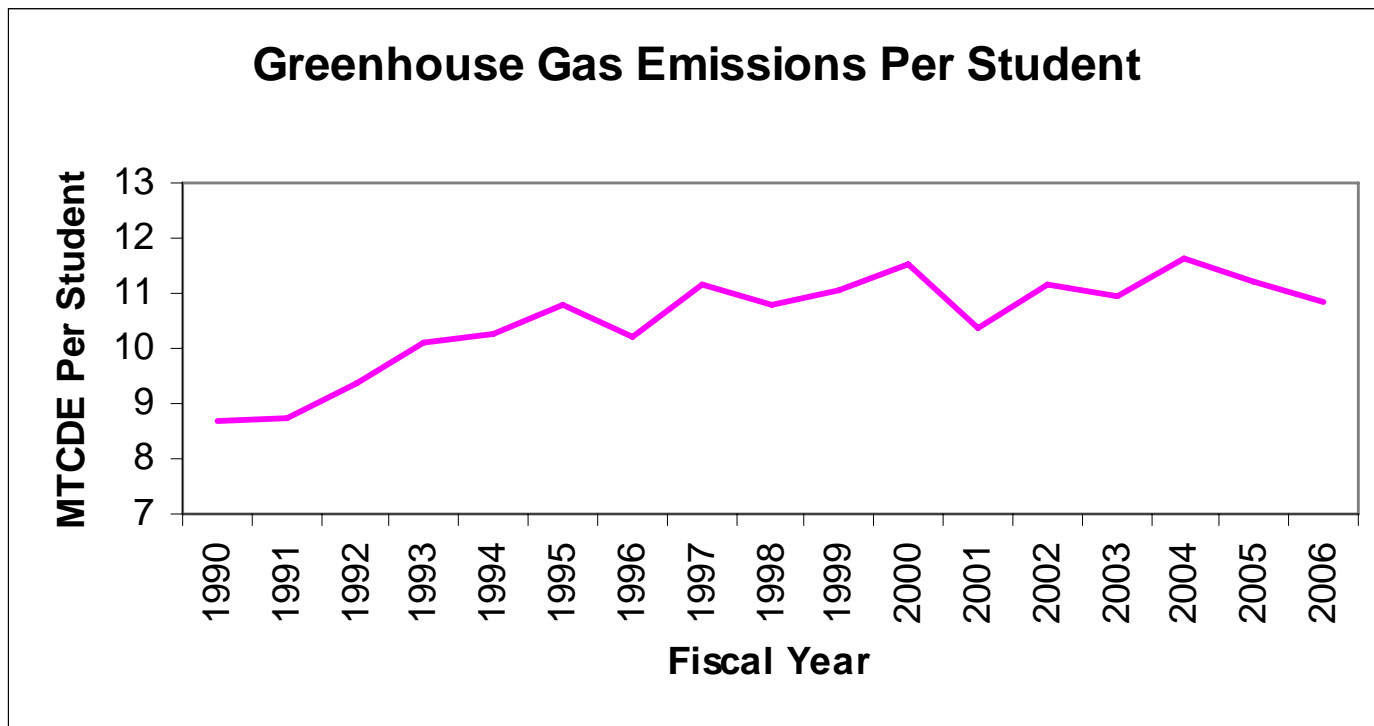


Results: UT's Carbon Footprint

| Fiscal Year | Net Emissions (MTCDE) |
|-------------|-----------------------|
| 2002-03 | 267,196 |
| 2003-04 | 255,055 |
| 2004-05 | 276,638 |
| 2005-06 | 269,360 |
| 2006-07 | 263,374 |

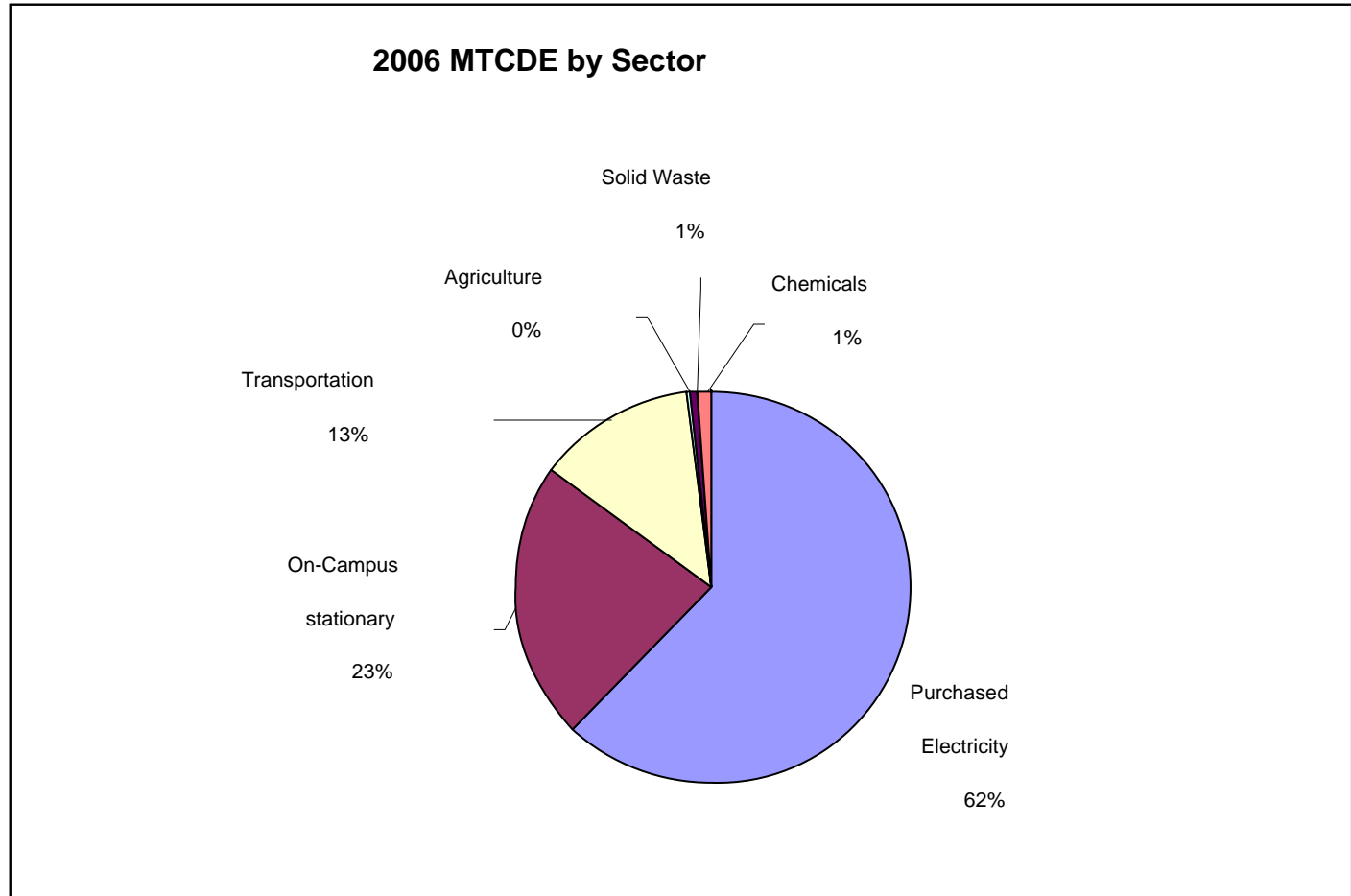
Source: Clean Air-Cool Planet Campus Carbon Calculator

Results: UT's Carbon Footprint



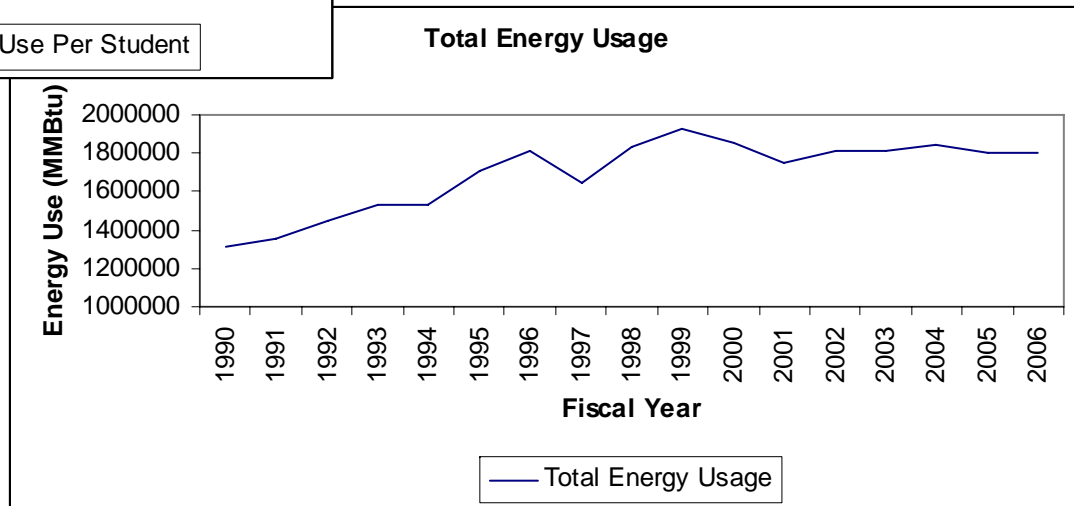
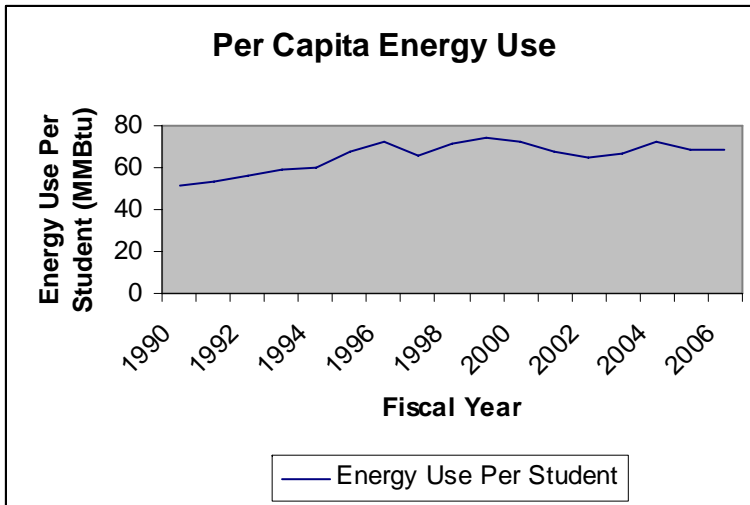
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Results: UT's Carbon Footprint

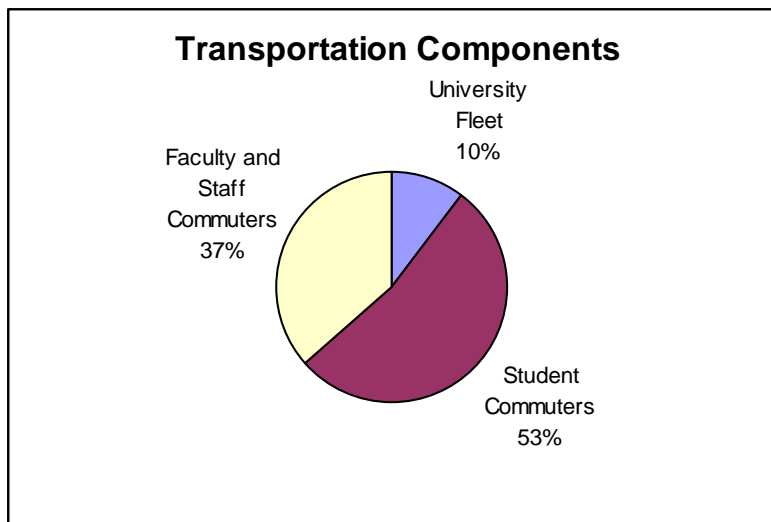
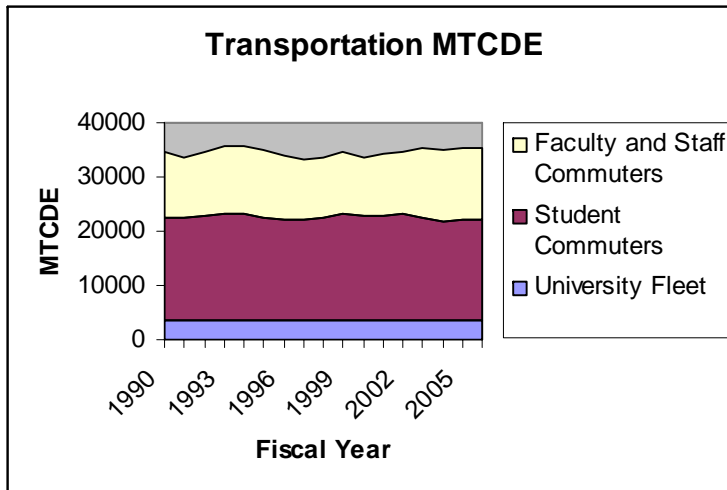


Source: Clean Air-Cool Planet Campus Carbon Calculator

UT's Energy Usage (MMBtu)



UT's Transportation Results



- Average commute
 - off-campus students: 11.08 miles (~8 miles adjusted)
 - faculty: 10.84 miles
 - staff: 12.9 miles



Resources

- Clean Air-Cool Planet Campus Carbon Calculator, www.cleanair-coolplanet.org/toolkit/
- World Resources Institute www.wri.org
- Greenhouse Gas Protocol, www.ghgprotocol.org