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

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

Source: Clean Air-Cool Planet Climate Action Toolkit: www.cleanair-coolplanet.org/toolkit
Results: UT’s Carbon Footprint

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<tr>
<th>Fiscal Year</th>
<th>Net Emissions (MTCDE)</th>
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<tr>
<td>2002-03</td>
<td>267,196</td>
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<td>2003-04</td>
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<td>2004-05</td>
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<td>2005-06</td>
<td>269,360</td>
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<td>2006-07</td>
<td>263,374</td>
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</tbody>
</table>

Source: Clean Air-Cool Planet Campus Carbon Calculator
Results: UT’s Carbon Footprint

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UT’s Energy Usage (MMBtu)

**Per Capita Energy Use**

- **Energy Use Per Student (MMBtu)**

**Total Energy Usage**

- **Energy Use (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

- World Resources Institute www.wri.org