

# **Greenhouse Gas (GHG) Inventory Program**

SUSTAINABILITY

**Temple University  
Philadelphia, PA**

**April 2009**



**Executive Summary**

Temple University (Temple) has prepared a greenhouse gas (GHG) inventory program in support of its participation in the American College and University Presidents' Climate Commitment (ACUPCC). The program was jointly developed by Temple's Office of Sustainability, Temple's Office of Facilities Management, and O'Brien & Gere. The purpose of the program is the following:

- Establish Temple's baseline carbon footprint
- Document trends in GHG emissions and emissions intensity relative to the baseline year

Inventory boundaries and definitions were established in a program kick-off meeting (see Attachment A) and are summarized here.

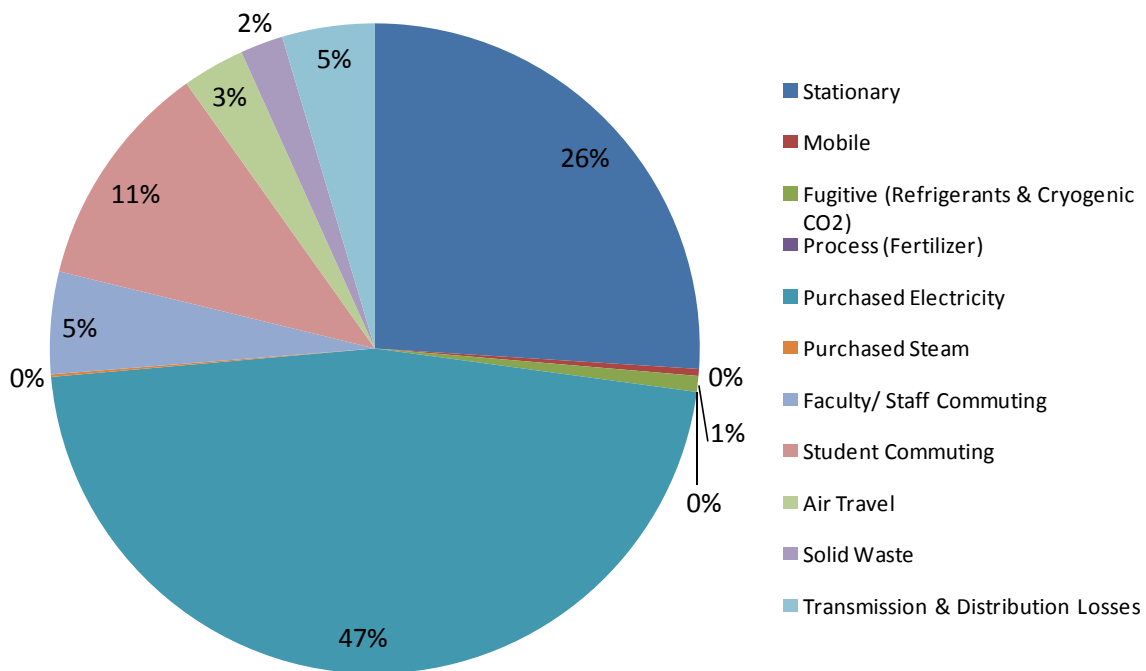
|                             |   |
|-----------------------------|---|
| GHG Accounting Protocols    | World Resources Institute/World Business Council for Sustainable Development (WRI/WBCSD) GHG accounting protocols in conjunction with the Clean Air – Cool Planet (CACP) Campus Carbon Calculator (V. 6.2)  |
| Organizational Boundary     | Based on operational control – report emissions from all GHG-emitting sources controlled by Temple, where control refers to sources metered by Temple and for which Temple has the ability to make future operational changes. Exclude Temple University Health System, Center City Campus, Harrisburg Campus, and Fort Washington Campus on this basis.  |
| Operational Boundary        | Scope 1 – Direct emissions: stationary sources, mobile sources (leased/owned), process sources (application of fertilizer), fugitive sources (refrigerant leakage, usage of cryogenic CO <sub>2</sub> ).<br>Scope 2 - Indirect emissions (those outside of the organizational boundary) from purchased electricity and steam.<br>Scope 3 - Other indirect emissions from employee and student commuting, employee air travel, landfilled solid waste, paper purchasing, and transmission and distribution losses. |
| <i>De minimis</i> threshold | 5%; Emission sources that collectively account for a small percentage of entity-wide emissions (<5%) can be called <i>de minimis</i> and may be approximated. Temple's <i>de minimis</i> sources include mobile sources, process sources, fugitive sources, purchased steam, and landfilled solid waste.  |
| Baseline year               | Fiscal year 2005-2006 (FY 2006). This is the first year for which complete, verifiable emissions data is available.   |
| Emission Intensity Metric   | Gross square footage (GSF) and full-time equivalent students (FTE). These are used to normalize emissions to account for institutional growth over time.  |
| Reporting frequency         | Fiscal year (July 1 to June 30) reporting. Report FY 2006, 2007, 2008 and at least every other year subsequently.   |

Specific emission sources for each of the Scope 1 to 3 categories were identified in a GHG activity description questionnaire (Attachment B). Data for each of these sources was collected in a GHG scorecard for FY 2006 to FY 2008 (Attachment C) with responsible parties for data collection summarized in Attachment D. The completed scorecard was used to populate the CACP Campus Carbon Calculator. The resulting emission estimates are summarized here.

|   |  | FY 2006        | FY 2007        | FY 2008        |
|---|--|----------------|----------------|----------------|
| Scope 1 Emissions (Metric tons CO <sub>2</sub> E)           | Stationary   | 58,834         | 56,871         | 46,739         |
|   | Mobile   | 782            | 796            | 803            |
|   | Fugitive (Refrigerants & Cryogenic CO <sub>2</sub> ) | 1,764          | 1,702          | 1,682          |
|   | Process (Agriculture/Fertilizer)                     | 14             | 11             | 13             |
|   | <b>Total Gross Emissions</b>                         | <b>61,394</b>  | <b>59,380</b>  | <b>49,238</b>  |
| Scope 2 Emissions (Metric tons CO <sub>2</sub> E)           | Purchased Electricity                                | 105,118        | 103,726        | 107,278        |
|   | Purchased Steam                                      | 281            | 315            | 324            |
|   | <b>Total Gross Emissions</b>                         | <b>105,400</b> | <b>104,041</b> | <b>107,602</b> |
| Scope 3 Emissions (Metric tons CO <sub>2</sub> E)           | Faculty/ Staff Commuting                             | 11,475         | 11,453         | 11,625         |
|   | Student Commuting                                    | 25,682         | 25,898         | 26,762         |
|   | Air Travel   | 7,047          | 7,868          | 7,950          |
|   | Solid Waste  | 4,810          | 4,582          | 4,267          |
|   | Paper Purchasing                                     | N/A            | N/A            | 213            |
|   | Transmission & Distribution Losses                   | 10,411         | 10,275         | 10,627         |
|   | <b>Total Gross Emissions</b>                         | <b>59,426</b>  | <b>60,076</b>  | <b>61,444</b>  |
| Scope 1 – 3 Gross Emissions (Metric tons CO <sub>2</sub> E) | <b>Total Gross Emissions</b>                         | <b>226,219</b> | <b>223,497</b> | <b>218,284</b> |
|   | Gross Square Footage (GSF)                           | 8,978,678      | 8,984,268      | 8,984,268      |
|   | Full-time Equivalent Students (FTE)                  | 27,055         | 27,560         | 28,535         |
|   | <b>Total Gross Emission Intensity per 1000 GSF</b>   | <b>25.20</b>   | <b>24.88</b>   | <b>24.30</b>   |
|   | <b>Total Gross Emission Intensity per FTE</b>        | <b>8.36</b>    | <b>8.11</b>    | <b>7.65</b>    |
| Scope 1 – 3 Net Emissions (Metric tons CO <sub>2</sub> E)   | Purchased Offsets                                    | -157           | -2,423         | -2,272         |
|   | <b>Total Net Emissions</b>                           | <b>226,063</b> | <b>221,074</b> | <b>216,012</b> |
|   | <b>Total Net Emission Intensity per 1000 GSF</b>     | <b>25.18</b>   | <b>24.61</b>   | <b>24.04</b>   |
|   | <b>Total Net Emission Intensity per FTE</b>          | <b>8.36</b>    | <b>8.02</b>    | <b>7.57</b>    |

*Baseline Year FY 2006*

In the baseline year, total gross emissions were 226,219 metric tons carbon dioxide equivalent (MTCO<sub>2</sub>E).

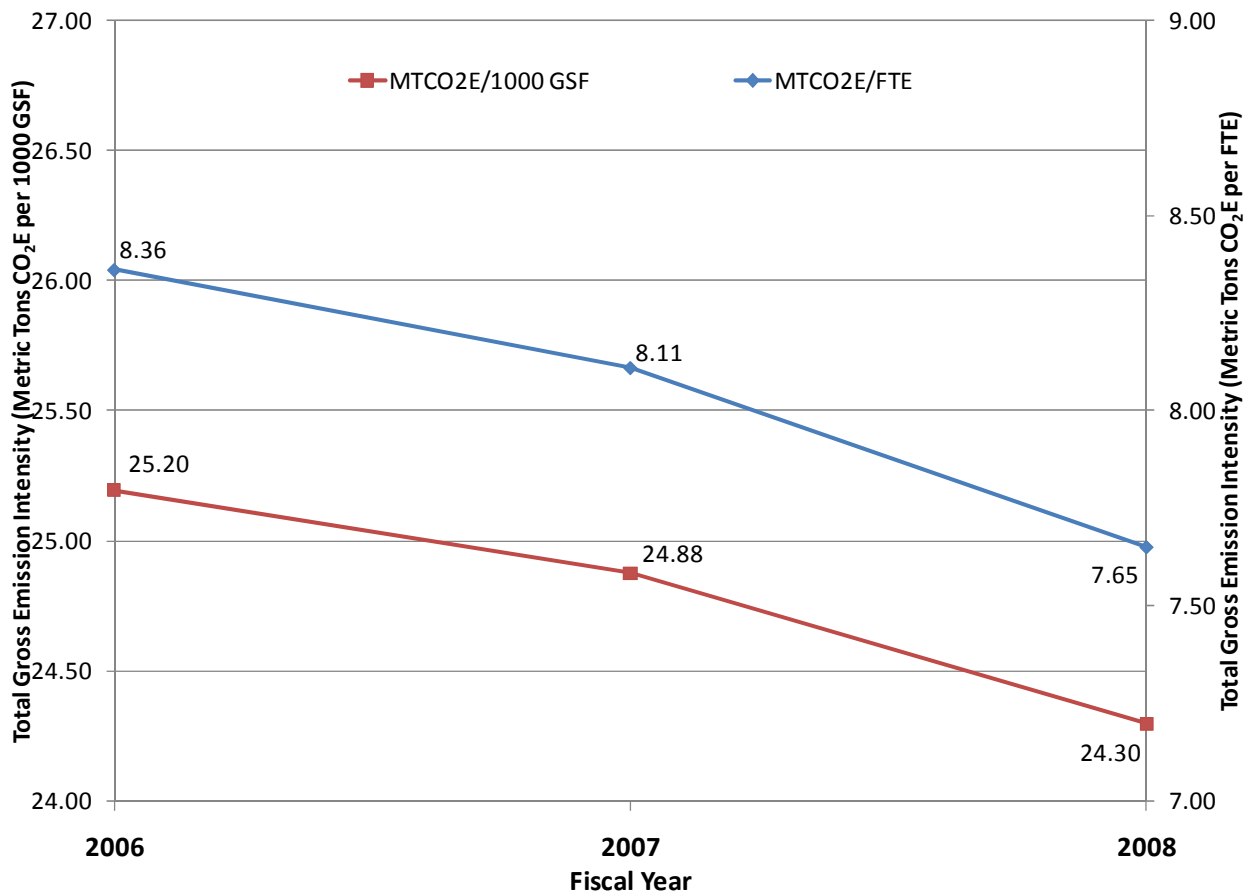


The primary emission sources were purchased electricity, stationary combustion, and commuting (student and faculty/staff), collectively accounting for approximately 89% of total annual gross emissions. As Temple develops its long-term plan for achieving carbon neutrality, these three sources will have to be prioritized in order to achieve meaningful overall GHG emissions reductions.

*Trends from FY 2006 to 2008*

In FY 2008, total gross emissions declined 3.5% relative to the FY 2006 baseline, due to stationary combustion fuel switching from fuel oil to natural gas. Over this period, total net emissions declined by 4.5% due to both fuel switching and an increase in purchased renewable energy credits (RECs) to offset purchased electricity.

In FY 2008, total gross emission intensity per 1000 GSF and per FTE declined 3.5% and 8.5%, respectively, relative to the FY 2006 baseline. Over the FY 2006 to 2008 period, total student enrollment (FTE) grew by 5.5% while total gross emissions declined, resulting in the considerable decline in emission intensity per FTE. As Temple develops its long-term plan for achieving carbon neutrality, emission intensity will have to continue to decline in order to reduce GHG emissions while allowing for institutional growth.



For reference, average Scope 1-3 gross emission intensities for doctorate-granting universities are 20.59 MTCO2E/1000 GSF and 8.33 MTCO2E/FTE (ACUPCC Reporting System, 2009; <http://acupcc.aashe.org/>). On a per FTE basis, Temple's emission intensity is slightly lower than average, whereas on a GSF basis, Temple's emission intensity is slightly higher than average. Overall, Temple's current emission intensities are comparable to peer institutions.

**Attachment A - Meeting Notes for Greenhouse Gas Inventory Program**

*To:* Temple University *cc:*  
*From:* Parikhit (Ricky) Sinha, O'Brien & Gere  
*Re:* Meeting Notes  
*File:*  
*Date:* February 2, 2009

- I. Project Personnel Sign-in
- II. Confirm Inventory Boundaries and Definitions
- III. Next Steps – Project schedule, questionnaire, and key contacts

| Name                   | Title                  | Organization   | Phone        | Email                   |
|------------------------|------------------------|----------------|--------------|-------------------------|
| Kurt Bresser           | Energy Manager         | Temple U.      | 215-204-4515 | kurt.bresser@temple.edu |
| Sandy McDade           | Dir. of Sustainability | Temple U.      | 215-204-2517 | smcdad01@temple.edu     |
| Leigh-Golding DeSantis | Graduate Student       | Temple U.      | 856-397-3858 | lgd2@temple.edu         |
| Parikhit (Ricky) Sinha | Technical Director     | O'Brien & Gere | 215-628-9100 | sinhap@obg.com          |
| Sarah Strode           | Project Scientist      | O'Brien & Gere | 215-628-9100 | strodesa@obg.com        |

Action Items

**Kurt and Leigh-Golding:** Complete GHG Questionnaire. Forward to Ricky and Sarah.

**Kurt:** Revise Clean Air Cool Planet spreadsheet to reflect organizational boundary below. Forward to Ricky, Sarah, and Leigh-Golding. Provide refrigerant worksheet. Provide wind energy purchase data.

**Leigh-Golding:** Provide contact list for data collection contacts; Revise FY 2006 Inventory Report based on Kurt's spreadsheet revisions.

**Sandy:** Schedule training session in February (preferably week of Feb. 9). Ricky is not available Feb. 13, 18, 19.

Inventory Boundaries and Definitions

## 1) Intended audience

- Current: American College and University Presidents Climate Commitment, Sustainability Endowment Institute, Princeton Review Green Rating, University stakeholders
- Potential Future: Climate Registry, State of Pennsylvania, U.S. EPA (all use GHG accounting protocols based on WRI/WBCSD protocols)

## 2) GHG accounting protocols

- The World Resources Institute and World Business Council for Sustainable Development (WRI/WBCSD) GHG accounting protocols are the international consensus standard that are the basis for GHG accounting protocols adopted by the International Standards Organization (ISO 14064), USEPA Climate Leaders, California Climate Action Registry, and the U.S. multi-state Climate Registry (adopted by 39 U.S. states, including Massachusetts). This is also the primary GHG accounting protocol recommended in the ACUPCC Implementation Guide. The Clean Air Cool Planet tool is generally consistent with the WRI/WBCSD protocols and is also recommended in the ACUPCC Implementation Guide.

## 3) Organizational boundary

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- Based on operational control – report emissions from all GHG-emitting sources controlled by Temple, where control refers to sources metered by Temple and for which Temple has the ability to make future operational changes. Exclude Temple University Health System, Center City Campus, Harrisburg Campus, and Fort Washington Campus on this basis.

#### 4) Operational boundaries

- Scope 1 – Direct emissions (those within the organizational boundary)
  - Stationary sources (e.g., boilers) – need to split out Hospital natural gas usage (for steam generation)
  - Mobile sources (e.g., leased/owned fleet vehicles) – need to designate responsible departments for data collection
  - Process sources (e.g., usage of cryogenic CO<sub>2</sub>, application of fertilizer) – need to check with EH&S coordinator
  - Fugitive sources (refrigerant leakage)
- Scope 2 - Indirect emissions (those outside of the organizational boundary)
  - Purchased utilities (electricity, steam) – need to split out Hospital electric; steam generated with mix of natural gas and No. 2 fuel oil by Trigen cogeneration plant
- Scope 3 - Other indirect emissions (optional)
  - Scope 3 emission sources should be included if there is
    - Reliable data,
    - Significant emissions,
    - Stakeholder interest,
    - Ability to reduce emissions
  - Include the following Scope 3 emission sources:
    - Employee and student commuting – based on commuting survey
    - Employee air travel – based on travel agent records, although not all employees use agent
    - Landfilled solid waste – some mix of tonnage tickets provided by Waste Management and tonnage estimated from dumpster quantity

#### 5) De minimis threshold

- Emission sources that account for a small percentage of entity-wide emissions (<5%) can be called de minimis and approximated (e.g., fugitive emissions from refrigerant leakage).

#### 6) Baseline year

- First year for which complete, verifiable emissions data is available: FY 2006

#### 7) Emission intensity metric

- Used to normalize emissions to account for institutional growth over time (gross square footage, full-time equivalent students) – from office of Institutional Research and office of Planning

#### 8) Reporting frequency

- Fiscal year (July 1 to June 30); FY 2006, 2007, 2008 and at least every other year subsequently; may internally report annually and externally report every other year.

Next Steps

**Proposed GHG Inventory Project Schedule**

| <b>Task description</b>  | <b>Anticipated start date</b> | <b>End date</b>      |
|--|-------------------------------|----------------------|
| Task 1 – Review of Temple’s FY 2006 Inventory                  | February 2, 2009              | February 27, 2009    |
| Task 2 – FY 2007 & FY 2008 Inventory Development and Reporting | March 2, 2009                 | April 30, 2009       |
| Task 3 – Training Temple Staff for Inventory Work              | February, 2009 (TBD)          | February, 2009 (TBD) |



| <b>Attachment B - Greenhouse Gas Inventory Program Questionnaire Worksheet</b> |  |   |  |
|--|--|---|--|
|  |  | Example entry   | User Entry (If not applicable, enter "NAP"; if not available, enter "NAV")   |
| Campus information   | Campus Name  | Temple University   | Temple University - Main, HSC (not including TUH), Ambler, Tyler and Podiatric   |
|  | Campus address (for correspondence regarding the inventory)                                    | 1801 N. Broad Street, Philadelphia, PA 19122                    | Facilities Management, 1009 W. Montgomery Ave., Philadelphia, PA 19122   |
| User information   | Name   | John Day  | Kurt Bresser   |
|  | E-mail   | John.Day@temple.edu   | <a href="mailto:kurt.bresser@temple.edu">kurt.bresser@temple.edu</a>   |
|  | Phone  | 1-215-394-1234  | 215-204-4515   |
|  | Fax  | 1-215-394-3211  | 215-204-6787   |
| Greenhouse gas emission sources  | 1a. Please list any stationary sources at your campus.   | Boilers, furnaces, generators, water heaters                    | Boilers, furnaces, standby and emergency generators, water heaters, burners, ceramic & glassmaking equipment and food service equipment.       |
|  | 1b. Please list any mobile sources owned or leased by your campus.                             | Light trucks, passenger cars, forklifts, aircraft               | Light trucks, passenger cars, forklifts, trash trucks, stakebodies, medium-duty trucks, tractors, sweepers, bobcat and small utility vehicles. |
|  | 1c. Please list any process sources at your campus.  | SF <sub>6</sub> usage, PFC usage, process CO <sub>2</sub> usage | None known.  |
|  | 1d. Please list any fugitive sources of refrigerants at your campus.                           | Refrigeration units, air conditioning units                     | (See complete listing of air conditioning equipment and refrigerants in a separate file.)  |
| 2.1. Stationary Combustion   | Please list fuels combusted by stationary sources at your campus.                              | Natural gas, fuel oil, propane                                  | Natural gas, #6 oil, #2 oil and propane.   |
|  | Of these fuels, please list those for which fuel consumption data is available.                | Natural gas, fuel oil, propane                                  | Natural gas, #6 oil, #2 oil and propane.   |
|  | Please list fuels combusted by mobile sources owned or leased by your campus.                  | Diesel, gasoline  | Diesel, gasoline and natural gas.  |
|  | Of these fuels, please list those for which fuel consumption data is available.                | Diesel, gasoline  | Consumption data for all mobile source fuels is available, just not on a vehicle-specific basis.   |
| 2.2. Mobile Source Combustion  | Please list mobile sources owned or leased by your campus for which mileage data is available. | Light trucks, passenger cars                                    | Mileage data is available for all vehicles registered for on-road use.   |
|  | Please list process sources at your campus for which greenhouse gas usage data is available.   | Process CO <sub>2</sub> usage                                   | NAP  |
| 2.3. Process Sources   | Please list types of refrigerants used at your campus.   | HFC-134a, HFC-23, R507  | (See complete listing of air conditioning equipment and refrigerants in a separate file.)  |
|  | Of these refrigerants, please list those for which total refrigerant charge data is available. | HFC-134a, HFC-23, R507  | (See complete listing of air conditioning equipment and refrigerants in a separate file.)  |



| Attachment B - Greenhouse Gas Inventory Program Questionnaire Worksheet |   |  |              |
|---|---|--|--------------|
|   | Example entry   | User Entry (If not applicable, enter "NAP"; if not available, enter "NAV")   |              |
| Campus information  | Temple University<br>1801 N. Broad Street, Philadelphia, PA 19122 | Temple University - Main, HSC (not including TUH), Ambler, Tyler and Podiatric<br>Facilities Management, 1009 W. Montgomery Ave., Philadelphia, PA 19122   |              |
| Campus contact  | John Day<br>John.Day@temple.edu<br>1-215-394-1234                 | Kurt Bresser<br>kurt.bresser@temple.edu<br>215-204-4515  |              |
| User information  |   |  | 215-204-6787 |
|   | Yes   | Yes  |              |
| 3.1. Electricity Consumption  | Yes   | Yes  |              |
| 3.2. Purchased Renewable Electricity                                    | No  | Yes, but not since 2008.   |              |
| 3.3. Heat   | No  | Yes, as steam.   |              |
| 3.4. Steam  | N/A   | Yes  |              |
| 3.5. Chilled water  | Yes   | Yes  |              |
| 4.1. Employee and student commuting                                     | Yes   | Yes  |              |
| 4.2. Employee business air travel                                       | No  | No   |              |
| 4.3. Landfilled solid waste   | No  | No   |              |
| 4. Scope 3 - Other Indirect Emissions                                   | N/A   | No   |              |
|   | Travel agent itineraries  | Travel Agency and, perhaps, Temple's Office of Travel Reimbursement  |              |
|   | Quantity of dumpsters filled per week.                            | (Please refer to the initial GHG Inventory report and the STF Report, both of which contain extensive notes on the sources and management of solid waste.) |              |
|   | Mixed paper, aluminum, #1 and #2 plastic                          | (Please refer to the initial GHG Inventory report and the STF Report, both of which contain extensive notes on the sources and management of solid waste.) |              |
|   | Mixed paper   | (Please refer to the initial GHG Inventory report and the STF Report, both of which contain extensive notes on the sources and management of solid waste.) |              |



# Attachment C - GHG SCORECARD Reporting Years FY 2006 to 2008

|   |  | Campus Name:                                     |             | Temple University: Main, Tyler, Podiatry, Ambler, Health Sciences, and Residence Halls |                        |
|---|--|--|-------------|--|------------------------|
|   |  | Campus Location (Address, City, State, Country): |             | Facilities Management, 1009 W. Montgomery Ave., Philadelphia, PA 19122                 |                        |
|   |  | Contact Person:                                  |             | Kurt Bresser   |                        |
|   |  | Phone Number:                                    |             | 215-204-4515   |                        |
|   |  | Email:   |             | <a href="mailto:kurt.bresser@temple.edu">kurt.bresser@temple.edu</a>                   |                        |
|   |  | Notes  |             |  |                        |
|   |  | Units  |             |  |                        |
|   |  | Fiscal Year 2007-2008                            |             | Fiscal Year 2006-2007  |                        |
|   |  | Fiscal Year 2005-2006                            |             |  |                        |
| <b>General Note: If data are not available ("N/A") or not applicable ("N/AP"), please indicate rather than leaving blank entries.</b> |  |  |             |  |                        |
| <b>Intensity Metrics</b>  |  |  |             |  |                        |
| 1.1   | Total Building Space Gross Square Footage    |  | 8,984,268   | 8,984,268  | 8,978,678              |
| 1.2   | Full Time Equivalent Students                | Unitless   | 28,535      | 27,560   | 27,055 <sup>a</sup>    |
| 1.3   | Operating Budget                             | \$   | 902,984,000 | 842,030,000  | 804,240,000            |
| 1.4   | Research Dollars                             | \$   | 80,724,000  | 75,754,000   | 83,062,000             |
| 1.5   | Energy Budget                                | \$   | 23,760,037  | 20,838,548   | 23,319,394             |
| 1.6   | Research Building Space Gross Square Footage | ft <sup>2</sup>                                  | 789,632     | 778,779  | 775,083 <sup>b</sup>   |
| 1.7   | Full Time Students                           | Unitless   | 26,892      | 25,863   | 25,280 <sup>a</sup>    |
| 1.8   | Part Time Students                           | Unitless   | 4,929       | 5,092  | 5,325 <sup>a</sup>     |
| 1.9   | Summer School Students                       | Unitless   | 4,223       | 4,360  | 4,282 <sup>a</sup>     |
| 1.10  | Faculty                                      | Unitless   | 2,260       | 2,209  | 2,239 <sup>c</sup>     |
| 1.11  | Staff  | Unitless   | 4,351       | 4,307  | 4,239 <sup>c</sup>     |
| <b>Scope 1 Emissions</b>  |  |  |             |  |                        |
| 2.1   | <b>Stationary Sources</b>                    |  |             |  |                        |
| 2.1.1   | Natural Gas                                  | MMBtu  | 849,082     | 316,359  | 156,252 <sup>d</sup>   |
| 2.1.2   | No. 2 Fuel Oil                               | Gallon   | 168,099     | 183,084  | 369,875 <sup>d</sup>   |
| 2.1.3   | No. 6 Residual Oil                           | Gallon   | 9,315       | 3,254,949  | 3,982,568 <sup>d</sup> |
| 2.1.4   | Propane                                      | Gallon   | 3,249       | 4,039  | 4,474 <sup>d</sup>     |
| 2.2   | <b>Mobile Sources - Owned and Leased</b>     |  |             |  |                        |
| 2.2.1   | Diesel                                       | Gallon   | 19,349      | 23,030   | 20,131 <sup>e</sup>    |
| 2.2.2   | Gasoline                                     | Gallon   | 45,095      | 43,264   | 43,804                 |
| 2.2.3   | Compressed Natural Gas                       | MMBtu  | 3,868       | 3,337  | 3,533                  |
| 2.3   | <b>Process Sources</b>                       |  |             |  |                        |
| 2.3.1   | Cryogenic CO <sub>2</sub>                    | Pounds   | 46,613      | 90,357   | 227,322                |
| 2.4   | <b>Fugitive Sources</b>                      |  |             |  |                        |
| 2.4.1   | HFC-134a Refrigerant Leakage                 | Pounds   | 2,817       | 2,817  | 2,817                  |
| 2.5   | <b>Agriculture</b>                           |  |             |  |                        |
| 2.5.1   | Fertilizer Application - Synthetic           | Pounds   | 14,223      | 14,581   | 17,130 <sup>f</sup>    |
| 2.5.2   | Fertilizer Application - Organic             | Pounds   | 0           | 375  | 50 <sup>f</sup>        |

*Includes all buildings under Temple's operational control. Excludes Temple University Health System, Center City Campus, Harrisburg Campus, and Fort Washington Campus on this basis*

*Refrigerants covered under the Kyoto Protocol and Climate Registry are HFC's (not CFC's or HCFC's).*

# Attachment C - GHG SCORECARD Reporting Years FY 2006 to 2008

**Campus Name:** Temple University; Main, Tyler, Podiatry, Ambler, Health Sciences, and Residence Halls  
**Campus Location (Address, City, State, Country):** Facilities Management, 1009 W. Montgomery Ave., Philadelphia, PA 19122  
**Contact Person:** Kurt Bresser  
**Phone Number:** 215-204-4515  
**Email:** [kurt.bresser@temple.edu](mailto:kurt.bresser@temple.edu)

General Note: If data are not available ("N/A") or not applicable ("N/AP"), please indicate rather than leaving blank entries.

| Scope 2 Emissions        |  | Notes   | Units     | Fiscal Year 2007-2008 | Fiscal Year 2006-2007 | Fiscal Year 2005-2006    |
|--------------------------|--|---|-----------|-----------------------|-----------------------|--------------------------|
| 3.1                      | Electricity usage  |   | kWh       | 214,657,304           | 207,550,363           | 200,479,805 <sup>a</sup> |
| 3.2                      | Purchased Renewable Electricity (Credits)  |   | kWh       | 4,546,000             | 4,786,000             | 240,000                  |
| 3.3                      | Purchased Steam  |   | MMBtu     | 4,528                 | 4,357                 | 3,807                    |
| <b>Scope 3 Emissions</b> |  |   |           |                       |                       |                          |
| 4.1                      | <b>Commuting</b>   | Commuting estimate scales results of 2008 Transportation Survey by changes in population. |           |                       |                       |                          |
| 4.1.1.1                  | Students - Personal Vehicle and Carpool  |   | miles     | 42,469,074            | 41,187,327            | 40,286,777               |
| 4.1.1.2                  | Students - Bus   |   | miles     | 12,686,724            | 12,303,830            | 12,034,810               |
| 4.1.1.3                  | Students - Light Rail  |   | miles     | 15,447,909            | 14,981,681            | 14,654,110               |
| 4.1.1.4                  | Students - Commuter Rail   |   | miles     | 25,178,149            | 24,418,255            | 23,884,356               |
| 4.1.2.1                  | Faculty - Personal Vehicle and Carpool   |   | miles     | 8,367,531             | 8,237,220             | 8,162,193                |
| 4.1.2.2                  | Faculty - Bus  |   | miles     | 478,021               | 470,577               | 466,290                  |
| 4.1.2.3                  | Faculty - Light Rail   |   | miles     | 2,149,640             | 2,116,163             | 2,096,888                |
| 4.1.2.4                  | Faculty - Commuter Rail  |   | miles     | 1,736,595             | 1,709,551             | 1,693,979                |
| 4.1.3.1                  | Staff - Personal Vehicle and Carpool   |   | miles     | 13,899,574            | 12,112,525            | 11,931,904               |
| 4.1.3.2                  | Staff - Bus  |   | miles     | 4,401,924             | 3,835,975             | 3,778,773                |
| 4.1.3.3                  | Staff - Light Rail   |   | miles     | 4,891,283             | 4,262,418             | 4,198,857                |
| 4.1.3.4                  | Staff - Commuter Rail  |   | miles     | 5,800,171             | 5,054,451             | 4,979,080                |
| 4.1.4.1                  | Summer School Students - Personal Vehicle and Carpool  |   | miles     | 6,720,863             | 6,993,608             | 6,785,300                |
| 4.1.4.2                  | Summer School Students - Bus   |   | miles     | 2,091,485             | 2,176,361             | 2,111,537                |
| 4.1.4.3                  | Summer School Students - Light Rail  |   | miles     | 2,546,683             | 2,650,032             | 2,571,100                |
| 4.1.4.4                  | Summer School Students - Commuter Rail   |   | miles     | 4,150,773             | 4,319,219             | 4,190,569                |
| 4.2                      | <b>Employee Business Air Travel</b>  |   | Miles     | 10,240,294            | 10,134,582            | 9,076,920 <sup>g</sup>   |
| 4.3                      | <b>Solid Waste</b>   |   |           |                       |                       |                          |
| 4.3.1                    | Solid Waste landfilled   |   | U.S. Tons | 3,940                 | 4,229                 | 4,440 <sup>h</sup>       |
| 4.3.2                    | Incinerated Waste (waste to energy plant not used for school power)  |   | U.S. Tons | 42                    | 31                    | 35                       |
| <b>Notes:</b>            |  |   |           |                       |                       |                          |
| a                        | Revised FY2006 enrollment numbers obtained from Director of Institutional Research.  |   |           |                       |                       |                          |
| b                        | Revised FY2006 research square footage from Director, Finance/Accounting; now account for laboratory research space classified by functionality instead of funding source.                 |   |           |                       |                       |                          |
| c                        | Revised FY2006 faculty/staff numbers obtained from Director of Institutional Research; numbers represent full time equivalent faculty and staff.   |   |           |                       |                       |                          |
| d                        | Revised FY2006 energy consumption obtained from Facilities Area Coordinator; adjusted for changes in data accounting method and treatment of line losses.                                  |   |           |                       |                       |                          |
| e                        | Sum of revised FY2006 gallons obtained from Office of Facilities Management, Campus Security, and HSC. FY2008 gasoline/diesel split was applied to total fuel values available for FY2006. |   |           |                       |                       |                          |
| f                        | Revised FY2006 pounds of fertilizer applied obtained from Senior Facilities Specialist, Grounds.   |   |           |                       |                       |                          |
| g                        | Revised FY2006 miles traveled obtained from Office of Management Analysis; corrected to accurately reflect FY2006 start & end dates.   |   |           |                       |                       |                          |
| h                        | Revised FY2006 tons of solid waste landfilled obtained from Office of Sustainability; these are best available values and are by calendar year.  |   |           |                       |                       |                          |

**Attachment D - Responsible Parties for Data Collection**

Overview

1. A meeting with members of Temple and O'Brien & Gere staff was held on 02/12/2009 with several of the parties responsible for GHG reporting for FY2005-06
2. Subsequently, a data collection form was prepared and sent out by O'Brien & Gere on 02/17/2009 for Temple staff to fill in and return by 03/15/2009
3. Data required for completion of the draft scorecard was made available and processed at O'Brien & Gere by 03/17/2009. Unless stated otherwise, information was provided by the responsible parties through filling out of the relevant fields in the data collection form received by them. See "Notes" below for data specifics
4. The draft scorecard was reviewed by Temple staff, and final numbers and additional descriptions were provided to O'Brien & Gere staff by 4/8/2009

| GHG Scorecard Section | Description                                  | Name               | Title  | Phone        | Email                       | Notes  |
|-----------------------|--|--------------------|--|--------------|-----------------------------|--|
| 1.1                   | Gross square footage                         | Marisa Cavaliere   | Facilities Coordinator - Maintenance                       | 215-204-6758 | marisa.cavaliere@temple.edu | Values for FY2007 and FY2008 obtained from Ms. Cavaliere through a phone conversation on 03/16/2009 and from file "Gross SF 2006.xls" by Ms. Leigh-Golding DeSantis. The additional square footage now on Main Campus due to the move of the Fox School of Business and the Tyler School of Art to the Main Campus has been excluded from this scorecard, due to the completion of this process after FY2008   |
| 1.2                   | Full-time equivalent students                | Tim Walsh          | Director, Institutional Research                           | 215-204-5050 | twalsh@temple.edu           | Faculty, staff, and student numbers were provided by Mr. Walsh via Ms. DeSantis for FY2006, FY2007, and FY2008 in an email dated 4/8/2009 from Ms. DeSantis.   |
| 1.3                   | Operating budget                             | Charles Smyth      | Director, Finance / Accounting                             | 215-204-1377 | cjsmyth@temple.edu          | --   |
| 1.4                   | Research budget                              | Robert Gage        | Director, Sponsored Research                               | 215-204-7467 | robert.gage@temple.edu      | Values obtained from an email dated 03/12/2009 from Mr. Gage.  |
| 1.5                   | Energy budget                                | Kurt Bresser       | Area Superintendent - Facilities                           | 215-204-4515 | kurt.bresser@temple.edu     | Values obtained from an email dated 03/17/2009 from Mr. Bresser.   |
| 1.6                   | Research building space gross square footage | Michael Murphy     | Director, Finance / Accounting                             | 215-204-7199 | mmurphy@temple.edu          | Research building GSF numbers were initially provided by Mr. Murphy for FY2006, FY2007, and FY2008 based on external funding. Upon discussions with Ms. Sandra McDade, it was agreed that functionality rather than funding were a more appropriate classification for research space. Updated values reflecting this change were provided by Mr. Murphy in an email dated 3/26/2009.  |
| 1.7-1.11              | Students, faculty, staff populations         | Tim Walsh          | Director, Institutional Research                           | 215-204-5050 | twalsh@temple.edu           | Faculty, staff, and student numbers were provided by Mr. Walsh via Ms. DeSantis for FY2006, FY2007, and FY2008 in an email dated 4/8/2009 from Ms. DeSantis.   |
| 2.1                   | Stationary sources                           | Kurt Bresser       | Area Superintendent - Facilities                           | 215-204-4515 | kurt.bresser@temple.edu     | Temple on-campus stationary source fuel consumption numbers were provided by Mr. Bresser for FY2006, FY2007, and FY2008, in a spreadsheet titled "Temple GHG Inventory Utility Reference Guide.xls"  |
| 2.2                   | Mobile sources (OFM)                         | Mark H. Gottlieb   | Manager, Facilities  | 215-204-9627 | mark.gottlieb@temple.edu    | Diesel, gasoline and CNG consumption numbers for FY2006, FY2007 and FY2008 were obtained separately from Mr. Gottlieb (revised FY2006 value from Mr. Gottlieb obtained via 3/24/2009 from Ms. DeSantis), Ms. Dietz, Mr. DeNofa and Mr. De Luna, and are presented as a summation. Note: For FY2006 and FY2007, Ms. Dietz provided total (diesel+gasoline) consumption values due to limited data availability from her predecessor. These values, obtained in a phone conversation on 03/13/2009, were then scaled according to the separate values for diesel and gasoline separately provided by her (via Excel) for FY2008. |
| 2.2                   | Mobile sources (Campus Security)             | Janice Dietz       | Executive Assistant / Senior Coordinator - Campus Security | 215-204-7900 | janice.dietz@temple.edu     |  |
| 2.2                   | Mobile sources (Health Sciences Center)      | James DeNofa       | Manager, Facilities - HSC                                  | 215-707-4796 | james.denofa@temple.edu     |  |
| 2.2                   | Mobile sources (Residence Halls)             | Rafael de Luna III | Facilities Coordinator - Residence Halls                   | 215-204-9630 | rdeLuna@temple.edu          |  |
| 2.3                   | Process sources (Cryogenic CO2)              | Kurt Bresser       | Area Superintendent - Facilities                           | 215-204-4515 | kurt.bresser@temple.edu     | Values obtained from a file titled "Airgas (Bresser) Temple Usage 020309.xls" from Mr. Bresser.  |

|               |   |                        |  |              |                              |   |
|---------------|---|------------------------|--|--------------|------------------------------|---|
| 2.4           | Fugitive sources (Refrigerants)                         | Kurt Bresser           | Area Superintendent - Facilities                         | 215-204-4515 | kurt.bresser@temple.edu      | Values obtained from an email dated 03/17/2009 from Mr. Bresser.  |
| 2.5           | Agriculture   | Craig Roncace          | Senior Facilities Specialist                             | 215-204-1303 | craig.roncace@temple.edu     | Percentage nitrogen content for synthetic fertilizer updated per an email from Ms. DeSantis dated 4/1/2009.   |
| 3.1           | Purchased electricity                                   | Kurt Bresser           | Area Superintendent - Facilities                         | 215-204-4515 | kurt.bresser@temple.edu      | Temple on-campus stationary source fuel consumption numbers were provided by Mr. Bresser for FY2006, FY2007, and FY2008, in a spreadsheet titled "Temple GHG Inventory Utility Reference Guide.xls"   |
| 3.2           | Purchased renewable energy (credits, offsets)           | Kurt Bresser           | Area Superintendent - Facilities                         | 215-204-4515 | kurt.bresser@temple.edu      | Values obtained from a file titled "Wind Purchase Summary.xls" from Mr. Bresser.  |
| 3.3           | Purchased steam   | Kurt Bresser           | Area Superintendent - Facilities                         | 215-204-4515 | kurt.bresser@temple.edu      | Temple on-campus stationary source fuel consumption numbers were provided by Mr. Bresser for FY2006, FY2007, and FY2008, in a spreadsheet titled "Temple GHG Inventory Utility Reference Guide.xlsx"  |
| 3.3           | Purchased steam (fuel mix)                              | Jonathan S. Wohl       | Business Development Manager                             | 267-350-5813 | jwohl@veoliaenergyna.com     | Fuel mix for purchased steam obtained from Mr. Wohl of Trigen via Mr. Bresser in an email dated 3/26/2009.  |
| 4.1           | Commuting   | NA                     | NA   | NA           | NA                           | Results from 2008 Temple Transportation Survey (as entered in the Clean Air Cool Planet v5.0 worksheet for FY2006) were used to provide percentages, trips/week, miles/trip, and weeks/year data. These values were then entered into Clean Air Cool Planet v6.2, along with known population data from Mr. Walsh, to obtain commuting numbers for FY2007 and FY2008. |
| 4.2           | Air Travel  | Ramona Richardson      | Administrative Specialist, Office of Management Analysis | 215-204-5144 | ramona.richardson@temple.edu | Air travel documentation is in the form of PDF files with line-by-line itineraries by fiscal year supplied by Ms. Richardson, from Mr. Larry Handel of Campus Travel Management, Annapolis, MD. 6-monthly data was available for FY07-08; this was doubled to provide annualized data for that year. Full fiscal year data was available for FY2006 and FY2007.       |
| 4.3.1         | Solid waste (Main, Ambler, Tower)                       | Mark H. Gottlieb       | Manager, Facilities                                      | 215-204-9627 | mark.gottlieb@temple.edu     | Solid waste numbers were originally obtained separately from the three sources listed to the left; the numbers were revised and consolidated by Ms. McDade in an email dated 3/27/2009.   |
| 4.3.1         | Solid Waste (Residence Halls)                           | Rafael de Luna III     | Facilities Coordinator - Residence Halls                 | 215-204-9630 | rde luna@temple.edu          |   |
| 4.3.1         | Solid Waste (College of Podiatric Medicine)             | Anthony Morris         | Manager, Facilities                                      | 215-625-5240 | amorris@tuspm.temple.edu     |   |
| 4.3.2         | Incinerated Solid Waste                                 | David McDonough        | Manager - Environmental Health & Safety                  | 215-707-0109 | david.mcdonough@temple.edu   | Values obtained from emails dated 03/13/2009 from Mr. McDonough.  |
| Miscellaneous | Electric Vehicle Usage<br>Composting<br>Purchased Paper | Leigh-Golding DeSantis | Graduate Extern<br>Sustainability Coordinator            | 215-204-1715 | lgd2@temple.edu              | While not part of the Temple GHG Scorecard, electric vehicle usage, composting, and purchased paper are available fields for entry into the Clean Air - Cool Planet Campus Carbon Calculator, v6.2 (CA-CP). The values for these fields were provided by Ms. DeSantis in emails dated 4/3/2009 (revision on 4/6/2009), 4/3/2009, and 4/6/2009, respectively           |