



# 2009

## ACC Greenhouse Gas Inventory Report



Andy Kim

Office of Environmental Stewardship/FAO

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## **Executive Summary**

The Austin Community College District Board of Trustees adopted Sustainability Policy C-9 in February 2009. ACC also signed the American College and University Presidents Climate Commitment (ACUPCC), a demonstration of the college's commitment to join more than 600 colleges and universities in addressing the potentially harmful effects of global warming.

Five tangible action items were submitted in July 2009 as the first requirement for signatories of ACUPCC. Making the inventory of college's greenhouse gas (GHG) emissions is the second requirement and is the crucial step in planning for comprehensive campus sustainability.

ACC's total GHG emissions for FY09 (September 1, 2008, to August 31, 2009) was 41,710 metric tons of carbon dioxide equivalent (MT CO<sub>2</sub>e). ACC's total GHG emissions per full-time equivalent student (FTE) were 4.6 MT CO<sub>2</sub>e, and total GHG emissions per 1,000 square feet were 30.8 MT CO<sub>2</sub>e.

ACC's total GHG emissions were slightly higher than national average for Associate's and Tribal Colleges by Carnegie Class. The national average for community college signatories was 3.03 MT CO<sub>2</sub>e and 27.87 MT CO<sub>2</sub>e, respectively.

## **Introduction**

This GHG report represents ACC's first comprehensive assessment of sustainability. The report was prepared in support of the ACUPCC signed by ACC President/CEO Dr. Stephen B. Kinslow on May 11, 2009. This inventory will help ACC to establish a districtwide climate protection plan for FY11 (September 1, 2010, to August 31, 2011).

## **Acknowledgements**

A districtwide project like this requires a systematic approach to achieve accurate and most inclusive results. The Board of Trustees, ACC president, and the President's Leadership Team gave great support to make this report possible.

Thanks to all individuals who took time from their busy schedules to prepare data and conduct research for ACC's first comprehensive greenhouse gas inventory.

### **Methodology**

At ACUPCC's recommendation, ACC used the latest version of Clean Air Cool Planet (CA-CP) calculator. The CA-CP calculator measures the four greenhouse gases, carbon dioxide, methane, nitrous oxide, and sulphur hexafluoride, and two groups of gases, hydrofluorocarbons and perfluorocarbons, identified by the Kyoto Protocol as gases subject to emission targets.

Greenhouse Gas	Lifetime (years)	Global Warming Potential (100-yr)
Carbon Dioxide CO <sub>2</sub>	N/A	1
Methane CH <sub>4</sub>	12	21
Nitrous Oxide N <sub>2</sub> O	114	310
Sulfur Hexafluoride SF <sub>6</sub>	3200	23,900

Source: [www.ipcc.ch/pdf/assessment-report/ar4/wg1/ar4-wg1-chapter2.pdf](http://www.ipcc.ch/pdf/assessment-report/ar4/wg1/ar4-wg1-chapter2.pdf)

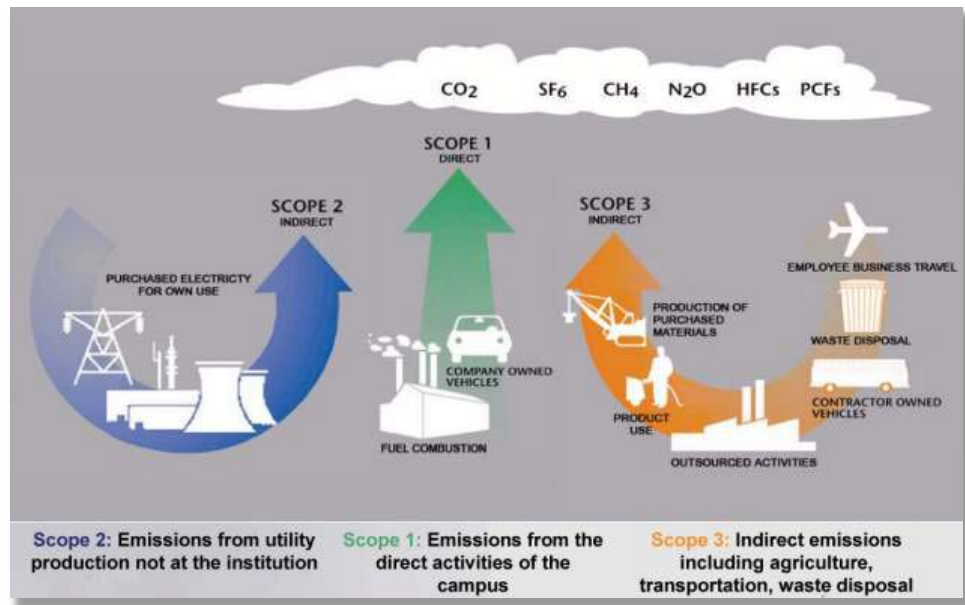
#### 1. Organizational Boundaries

Seven ACC campuses and two administrative locations were included for FY09 data as well as three buildings leased and operated by ACC. ACC holds various classes in other facilities that are neither owned nor operated by ACC. This facilities usage was not included in the report.

#### 2. Operational Boundaries

The CA-AP calculator defines three levels of responsibility for emissions:

- Scope 1 GHG emissions are emissions directly occurring "from sources that are owned or controlled by the institution, including: on-campus stationary combustion of fossil fuels; mobile combustion of fossil fuels by institution-owned/controlled vehicles; and "fugitive" emissions. Fugitive emissions result from intentional or unintentional releases of GHGs, including the leakage of HFCs from refrigeration and air conditioning equipment as well as the release of CH<sub>4</sub> from institution-owned farm animals."
- Scope 2 emissions are "indirect emissions generated in the production of electricity consumed by the institution."
- Scope 3 emissions are all the other indirect emissions that are "a consequence of the activities of the institution, but occur from sources not owned or controlled by the institution," such as commuting, air travel for university activities, and waste disposal; embodied emissions from extraction, production, and transportation of purchased goods; outsourced activities; contractor-owned vehicles; and line loss from electricity transmission and distribution."



Source: WRI/WBCSD Greenhouse Gas Protocol, Corporate Accounting and Reporting Standard

**Data by Category**

1. Budget

Neil Vickers, associate vice president of finance & budget, provided the data for operation budget and utility cost. ACC doesn't separate energy cost from other utility expenditures. Water and wastewater costs were subtracted from total utility budget of FY09. Included costs were payments to Austin Energy, Texas Gas Service, Pedernales Electric Cooperative, and Atmos Energy.

2. Population

The Office of Institutional Effectiveness and Accountability publishes the annual Factbook containing collegewide data and statistics. It includes but is not limited to credit degrees and certificates awarded, student headcount, semester credit hours, contact hours, faculty, staffing table personnel, and facilities information.

	Fall 2008	Spring 2009	Summer 2009
<b>Student Headcount</b>	35,798	36,601	27,862
<b>Credit Hours</b>	281,149	284,414	147,061
<b>Contact Hours</b>	5,386,376	5,506,734	2,785,922
<b>Full-time Student Equivalent (FTE)*</b>	<b>18,743<sup>1</sup></b>	<b>18,961</b>	<b>13,822<sup>2</sup></b>

<sup>1</sup> Full-time Student Equivalent (FTE) is based on 15 SCH.

<sup>2</sup> For summer terms, a full-time student is one enrolled in six hours or more

	Full-time Faculty	Admin and Prof.Tech	Classified	Total
Fall 2008	526	431	737	1,694
Spring 2009	526	459	800	1,785

Fall 2008 and spring 2009 population data were averaged to represent the FY09 population data. The 2009 summer semester student population was reported separately.

### 3. Physical Size

Building gross square footages and assignable square footage information was acquired from the 2008-2009 Fact Book.

Building Gross Square Footage represents the sum of all square feet of floor areas within the outside faces of a building's exterior walls. Assignable square footage represents the amount of space within the interior walls of a room that can be used for programs. Major room use categories are: classrooms, laboratories, offices, study areas, special use space, general use areas, support rooms, healthcare, residential, and unclassified space.

Campus	Ownership	Assignable (Sq.Ft.)	Building Gross (Sq.Ft.)
CYP	Owned	83,946	113,912
EVC	Owned	147,846	259,120
HBC	Owned	79,695	111,924
NRG	Owned	104,535	152,425
PIN	Owned	71,235	107,383
RGC	Owned	102,257	208,550
RVS	Owned	129,096	232,600
SVC	Owned	49,464	55,946
SAC	Owned	69,636	86,930
SCS	Leased	17,563	17,563
SPS	Leased	4,200	4,200
Attaché	Leased	6,276	4,470
<b>Total</b>		865,749	1,355,023

## 4. Campus Stationary Sources

ACC does not have any stationary sources other than the usage of natural gas (NG) for heating in winter months. All NG purchase data from Texas Gas Service and Atmos Energy were calculated.

	Consumption(CCF)	Consumption(MMBtu)
<b>CYP</b>	3,733	373.3
<b>EVC</b>	8,765.18	876.52
<b>HBC</b>	437	43.7
<b>NRG</b>	496.04	49.60
<b>PIN</b>	0	0
<b>RGC</b>	6,853.31	685.33
<b>RVS</b>	16,105.58	1,610.56
<b>SVC</b>	3,694	369.4
<b>SAC</b>	35.74	3.57
<b>SCS</b>	106	10.6
<b>SPS</b>	23	2.3
<b>Attaché</b>	746	74.6
<b>Total</b>	40,994.85	4,099.48

## 5. Direct Transportation Sources

The ACC fleet uses districtwide gas cards for its fuel needs. Two types of fuels had been purchased for the fleet in FY09.

	<b>Gasoline Fleet (Gallons)</b>	<b>Diesel Fleet(Gallons)</b>
<b>FY09</b>	46,514	4,798

## 6. Refrigerants &amp; Chemicals

ACC uses HCFC-22 for facilities cooling needs. FY09 invoices of this chemical purchase were obtained from the Building and Grounds Department.

## 7. Purchased Electricity, Steam, and Chilled Water.

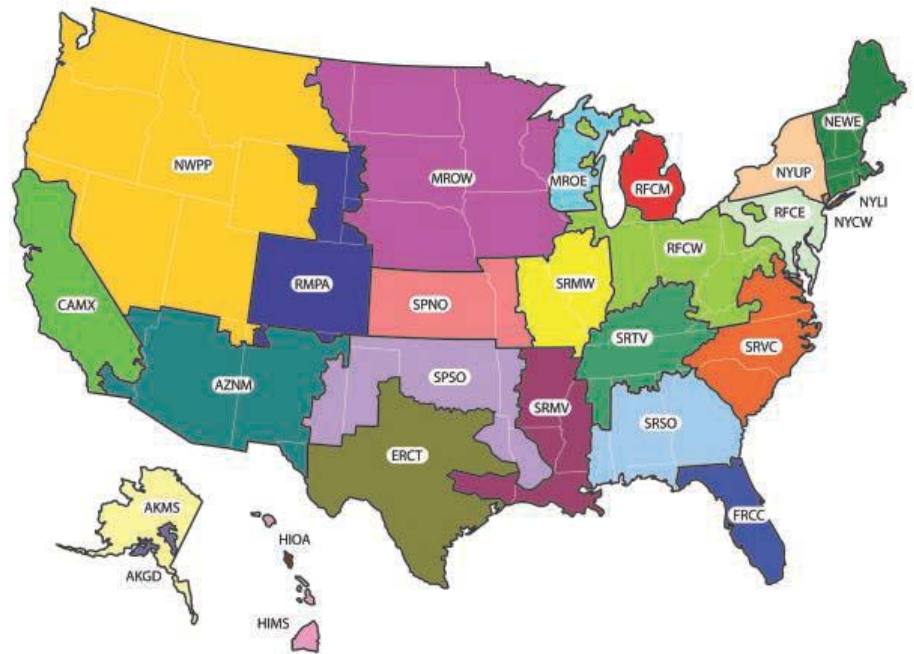
ACC purchases electricity from Austin Energy and Pedernales Electric Cooperative. ACC does not purchase steam or chilled water. All electricity consumption data were acquired from local utility company websites.

	<b>Electricity Consumption(KWh)</b>
<b>CYP</b>	5,159,140
<b>EVC</b>	4,515,100
<b>HBC</b>	2,245,600
<b>NRG</b>	3,918,000
<b>PIN</b>	3,198,344
<b>RGC</b>	3,108,160
<b>RVS</b>	4,778,765
<b>SVC</b>	1,404,100
<b>SAC</b>	2,698,383
<b>SCS</b>	91,680
<b>SPS</b>	50,868
<b>Attaché</b>	647,400
<b>Total</b>	31,815,540

Custom Fuel Mix data were gathered from Austin Energy Annual Report 2009.

Fuel Type	MWH	Percent
Coal	3,756,354	29.7%
Nuclear	3,512,240	27.8%
Natural Gas	3,507,087	27.8%
Renewables	1,259,308	10.0%
Power Purchased	1,231,064	9.7%
Power Sales	(638,329)	(5.1%)
<b>Total</b>	<b>12,627,724</b>	<b>100%</b>

Source: <http://www.austinenergy.com/About%20Us/Newsroom/Reports/annualReportSystemInfo2009.pdf>



Source: <http://www.epa.gov/cleanenergy/energy-resources/eGRID/index.html>

## 8. Commuting

ACC's annual transportation survey was conducted in 2009, and the survey data were used to calculate percentage of each mode, average mileage, and frequency of travel to and from campus for students, faculty, and staff.

	Personal Vehicle	Round Trips / Week	Weeks / Year	One way Miles / Trip
<b>Student - Personal Vehicle</b>	80%	3	47	13
<b>Student - Carpool</b>	5%			
<b>Student - Bus</b>	11%			
<b>Faculty - Personal Vehicle</b>	92%	4	47	13
<b>Faculty - Carpool</b>	1%			
<b>Faculty - Bus</b>	3%			
<b>Staff - Personal Vehicle</b>	88%	5	47	16
<b>Staff - Carpool</b>	1%			
<b>Staff - Bus</b>	5%			

## 9. Directly Financed Outsourced Travel

All air flights arranged by ACC's travel agent were logged and billed through a single account. Monthly invoices were collected, and each trip was broken down to separate connecting flights for total flight mileage calculation. However, no data were available for flights that were arranged by employees and reimbursed by ACC.

ACC had rented vehicles from two local companies for educational and business usage. Monthly invoices were collected and calculated. Some invoices didn't reveal mileage information due to the predetermined fee structure. Average mileage information was used when the mileage information was not available with the rental history.

## 10. Study Abroad Travel

The number of students and their destinations was provided by Workforce Education and Business Development Division.

Destination Country	#of People	Airport	Airport	Airport	Airport	Round Trip
England	9	AUS	LHR			9800
Japan	15	AUS	NRT			13020
Costa Rica	9	AUS	SJO			3300

<b>Costa Rica</b>	10	AUS	SJO			3300
<b>Italy</b>	6	AUS	FLR			11260
<b>Italy</b>	12	AUS	JFK	CDG	FLR	11372
<b>Spain</b>	15	AUS	Dal	MAD		10264
<b>Peru</b>	22	AUS	HOU	LIM		6544
<b>Mexico</b>	14	AUS	HOU	MID		1696
<b>Total</b>						<b>70556</b>

#### 11. Solid Waste

Waste data were the most difficult data to collect. ACC has a third-party vendor that provides waste management service districtwide. Its equipment is not equipped to measure the weight of the trash. In addition, waste collection routes usually include multiple commercial sites as well as ACC campuses in a single trip. In absence of concrete data, vendors estimated solid waste volume, and the volume-to-weight conversion factor was used to estimate FY09 solid waste data.

#### 12. Wastewater

Local utility companies use an averaging period method to assess wastewater charges. Therefore, actual wastewater data were not available. Instead, total water consumption was calculated, and conversion factor<sup>3</sup> was applied to estimate wastewater volume data.

#### 13. Paper

Paper purchase invoices were collected and calculated per paper sizes and types of paper.

<sup>3</sup> ref. 'Corbitt, Robert', 'Standard Handbook of Environmental Engineering', '1990'

**Findings**

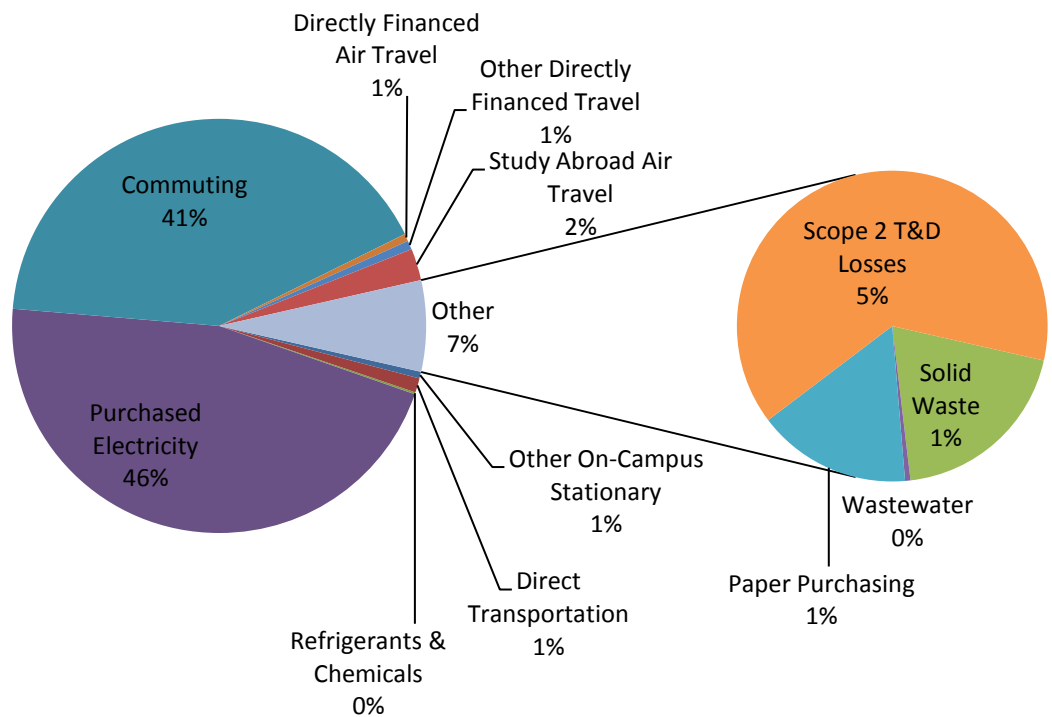
1. Total GHG Emissions by Source

ACC’s total greenhouse gas (GHG) emissions from all sources (scope1, 2, and 3) for FY09 were 41,710 metric tons of carbon dioxide equivalent (MT eCO<sub>2</sub>).

The combination of emissions from purchased electricity and commuting was 36,437.3 MT eCO<sub>2</sub>, representing more than 87percent of ACC’s total GHG emissions.

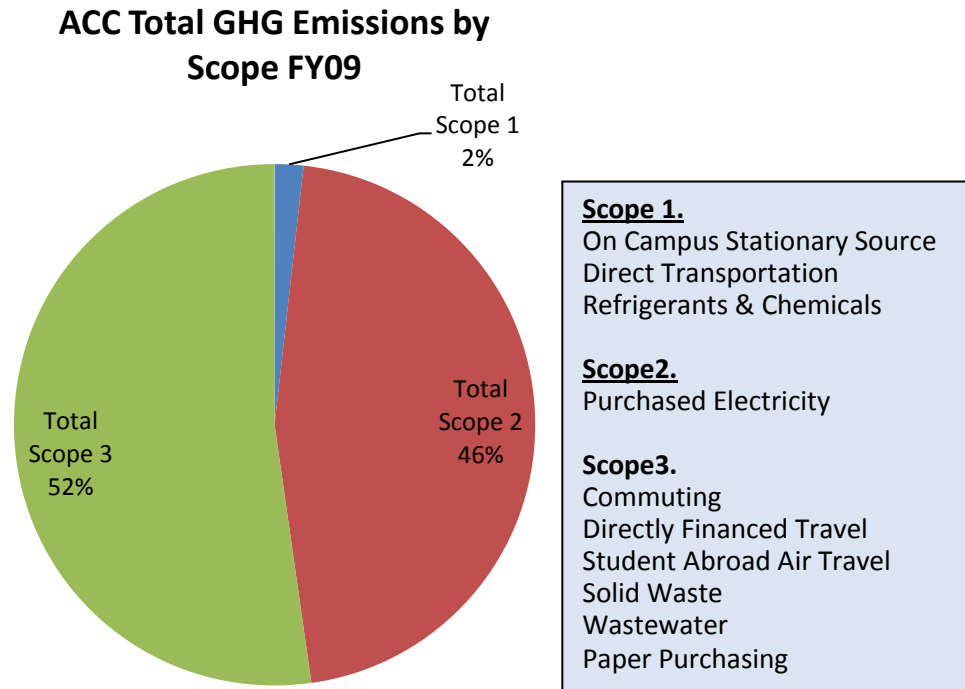
The combination of all scope 1 and scope 2 transportation-related emissions was 19,285.5 MT eCO<sub>2</sub>, representing more than 46 percent of ACC’s total GHG emissions.

**ACC Total GHG Emissions by Source FY09**



## 2. Total GHG Emissions by Scope

The combination of indirect emissions, scope 2 and scope 3, was 40,968.3 MT eCO<sub>2</sub>, representing more than 98 percent of ACC's total GHG emissions.



## 3. ACUPCC Signatories Comparison

As of May 2010, the national average for GHG emissions from the ACUPCC-affiliated community colleges was 3.01 MT eCO<sub>2</sub> per FTE and 27.93 MT eCO<sub>2</sub> per 1,000 square feet. In comparison, ACC's total GHG emissions were 4.6 and 30.8, respectively.

However, when ACC's GHG emissions were compared with Texas colleges and universities, the result was inconclusive due to the limited number of sample data.

Institution Name	FTE	Facilities (Sq.Ft.)	Net Emission (Scope 1+2)	Net Emission, metric tons CO <sub>2</sub> e	Per FTE, metric tons CO <sub>2</sub> e	Per 1000 sq.ft., metric tons CO <sub>2</sub> e
<b>National Assoc. College Average</b>					<b>3.01</b>	<b>27.93</b>
Austin College	1,283	774,924	9725	13,965	10.9	18
<b>Austin Community College District</b>	<b>9137</b>	<b>1,328,790</b>	<b>19919</b>	<b>41,710.10</b>	<b>4.6</b>	<b>30.8</b>
Cedar Valley College	2,963	349,028		13,459	4.5	38.6
El Centro College	2,460	676,005	9729	17,927	7.3	26.5
Huston-Tillotson University	675	244,296	2871	3,927	5.8	16.1
Lee College	5,833	588,956	12313	16,512	2.8	28
McLennan Community College	11,854	600,000		9,932	0.8	16.6
North Lake College	5,045	534,053	7042	17,867	3.5	33.5
Rice University	4,993	3,795,679	85698	53,084	10.6	14
Richland College	9,015	633,027	8216	23,973	2.7	37.9
Texas Christian University	8,292	3,496,743	59773	88,882	10.7	25.4
Trinity University	2,462	2,298,000	27552	32,405	13.2	14.1
University of Houston - Downtown	7,035	1,389,440	13524	13,524	1.9	9.7
University of Houston - Victoria	751	157,898	2203	2,358	3.1	14.9
University of North Texas	24,012	6,150,179	75145	123,927	5.2	20.2

Source: <http://acupcc.aashe.org>

**Conclusion**

ACC's GHG emissions were heavily concentrated in two categories, purchased electricity and transportation. Transportation emissions were comprised of direct (scope 1) and indirect (scope3) sources.

With the long summer months in Texas, the big portion of ACC's electricity consumption directed toward air conditioning. Also, rapid enrollment growth in recent years added more occupants to facilities and resulted in increased energy consumption.

ACC has no on-campus housing, so students commute to ACC. This creates traffic and parking issues as well as GHG emissions increase. ACC is working on various initiatives to reduce single-occupant vehicle miles by incentivizing mass-transit ridership and other alternative modes.

**Next Step**

Within next 12 months, ACC will be working on a climate action plan based on this report's findings and the ACUPCC guidelines. This process will be shared with stakeholders throughout the district.

**Additional Information**

ACC's comprehensive GHG inventory data can be found on the ACUPCC reporting website.

Ref: <http://acupcc.aashe.org/>