ANTIOCH UNIVERSITY
LOS ANGELES

# Greenhouse Gas Emissions Report
# 2011

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Dear Friends,

Earlier in 2012 the Antioch University, Los Angeles (AULA) Office of the President initiated a project to develop a greenhouse gas emissions report that would establish a baseline for the university. This report complies with the requirements of the American College and University Presidents' Climate Commitment.

I'm pleased to present the following report, which establishes the AULA's greenhouse gas emissions baseline for the 2011 calendar year accounting for emissions generated from AULA's consumption of electricity, natural gas, refrigerants, and gasoline and diesel fuels during this period.

I invite you to explore this report so you may better understand AULA's greenhouse gas emissions profile. I hope this report will continue to foster constructive dialog that will address the various opportunities associated with reducing the university's carbon footprint.

Sincerely,

Tex Boggs, Ph.D.
President
Antioch University, Los Angeles

## Core Values

Founded in 1972, Antioch University Los Angeles (AULA) is an institution of higher education offering both undergraduate and graduate degrees. With nearly 500 enrolled students and more than 6,000 alumni, AULA has a long track record of demonstrated commitment to social justice, service to community, and life long learning.

Coupled with these values is a core commitment to sustainability. AULA's newest program, the Master of Arts in Urban Sustainability seeks to build the next generation of environmental leaders and facilitate learning opportunities on and off campus for students to explore the relationship between the environment, economy, and society. This dedication extends beyond the classroom and is evident in AULA's commitment to sustainability within its own operations and as national environmental leader within higher education.

## Education From a Distance

AULA offers a number of low residency programs, with students enrolled from around the world and learning through courses taught both online and during in-person residencies. This program model greatly expands the reach of AULA's influence while maintaining minimal operational impacts.

## Taking Responsibility and The ACUPCC Challenge

As a 2007 signatory of the American College and University Presidents' Climate Commitment (ACUPCC), AULA seeks to minimize its own environmental footprint through the measurement and mitigation of generated greenhouse gas emissions (GHG). The University has made a commitment to proactively monitor and work to reduce its greenhouse gas emissions.

This report summarizes AULA's operational green house gas emissions for the 2011 calendar year. This inventory is one of many actions taken by the University towards minimizing its environmental impact. The inventory will quantify the environmental impact of the University's Operations relative to greenhouse gas emissions. The 2011 inventory will serve as a baseline emissions standard and guide for future emissions reductions.

The AULA campus is housed within a leased office space at Corporate Point Office Center. There is uncertainty regarding AULA's ability to take corrective action to lower its GHG footprint, given that they lease space and capital investments in the space are the responsibility of the facility owner, not the lessee. However, AULA has made the decision to report all emissions for its leased space and take full responsibility for them.

Antioch University, Los Angeles is one of the five campuses of Antioch University. The AULA campus is located in Culver City, California and operates within a shared corporate office park.

## Greenhouse Gases

**(CO2)** Anthropogenic carbon dioxide enters the atmosphere through the burning of fossil fuels, the majority of which are in the form of oil, natural gas, and coal.

**(CH4)** Methane is emitted during the production and transportation of coal, natural gas, and oil. Methane is also produced by the decay of organic waste and due to various agricultural practices and in particular the raising of livestock.

**(N2O)** Nitrous oxide is emitted during agricultural and industrial activities, as well as during combustion of fossil fuels and solid waste.

**Fluorinated Gases/Refrigerants** Hydrofluorocarbons, perfluorocarbons, and sulfur hexafluoride are industrial gases utilized for various applications. These gases are typically emitted in smaller quantities, however, generally have higher global warming potentials. These gases are mainly associated with air conditioning systems and industrial refrigeration.

## TERMINOLOGY

### Tonne

The tonne (t) or metric ton, sometimes referred to as a metric tonne, is an international unit of mass. A metric ton is equal to a Megagram (Mg), 1000 kilograms, 2204.6 pounds, or 1.1023 short tons.

### $CO_2e$

Each emission type and total will be converted and listed in a measurement called "$CO_2e$". The "e" stands for the equivalent amount CO2 molecules for each emission based on their global warming potentials.

## Global Warming Potential

The term *global warming potential* (GWP) is used to depict the gases' total contribution to global warming resulting from the effect of one unit of gas relative to one unit of carbon dioxide.

GWP measurements are based on both the ability of the gas to trap heat as well as the decay rate (the rate at which the gas is reduced in the atmosphere). Both of these factors are taken into account and measured relative to those of carbon dioxide ($CO_2$). In other words, the GWP of a gas reflects the effect or contribution to global warming relative to the effect of $CO_2$.

**Global Warming Potentials**
**100 year time horizon*

| | GWP |
|---|---|
| Carbon Dioxide - CO2 | 1 |
| Methane - CH4 | 25 |
| Nitrous Oxide - N20 | 298 |

***Figure 1:*** *Global Warming Potential factors based on Intergovernmental Panel on Climate Change Fourth Assessment Report.*

## Scope I – Direct Emissions

Scope I accounts for greenhouse gases emitted due to operations on property owned or operated by AULA. Scope I emissions sources are outlined below.

**Stationary Sources**

- Natural gas boiler utilized on the office park property used to heat the facilities.
- Backup generator for emergency loss of power.
- Landscaping activities related to the maintenance of the shared office park grounds.

**Fugitive Emissions**

Fugitive emissions include leaks of refrigerants and emergency release of fire-suppression chemicals. Composed of hydrofluorocarbons, these chemicals have high potential for global warming as that they damage the ozone layer and are persistent in the atmosphere. The office park utilizes two electric powered chillers for the cooling of its facilities. These chillers use the refrigerant HCFC-123. As that no refrigerant losses were reported for the 2011 calendar year, related emissions will not be included in the final inventory calculations.

**Mobile Sources**

AULA does note utilize a fleet of vehicles for transportation, therefore no mobile emission sources will be included in the inventory.

## Scope II- Indirect Emissions

Scope II emissions account for those gases emitted during the generation of electricity purchased from a federal agency or local utility.

AULA purchases electricity from Southern California Edison and is responsible for both their facilities usage as well as a 26.93% of the shared office park areas. This percentage represents the amount of the Corporate Pointe Office Center occupied by AULA facilities.

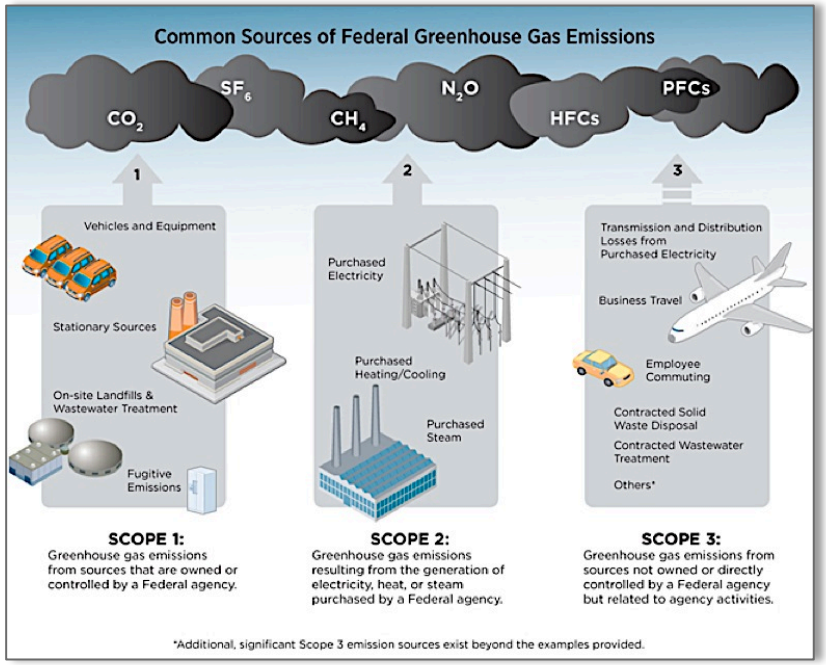



***Figure 2:*** *EPA's Greenhouse Gas Emission Reductions, September 16, 2011, U.S. Environmental Protection Agency. Accessed July 6, 2012. <http://www.epa.gov/oaintrnt/ghg/index.htm>*

## Scope III – Indirect Emissions

AULA has decided to omit Scope III emissions sources for this inventory report. Due to the nature of various low residence programs, it is difficult to capture these emissions in a statistically significant and accurate level. In an effort to initiate scope III data collection and analysis, the University implemented a commuter data survey. This survey collected information pertaining to modes of transportation and frequency of campus visits which will build an understanding of current commuter patterns as well as assist in analyzing trends into the future.

## Boundary Conditions

In setting the organizational boundaries for the GHG Inventory, AULA utilized the Operational Control parameters; accounting for 100% of the Scope One and Scope Two emissions for which the University has control.

This report adheres to the methodology outlined by the World Resources Institute Greenhouse Gas Protocol and includes all emissions sources from both Scope I and II direct and indirect greenhouse gas emissions sources. The specific greenhouse gas emissions include carbon dioxide (CO2), methane (CH4), nitrous oxide (N2O), and 2,2-Dichloro-1,1,1-trifluoroethane (HCFC-123).

The Greenhouse Gas Protocol is the product of a partnership between the World Resources Institute and the World Business Council for Sustainable Development and is the most widely used international GHG accounting tool for governments and business.

GREENHOUSE GAS PROTOCOL

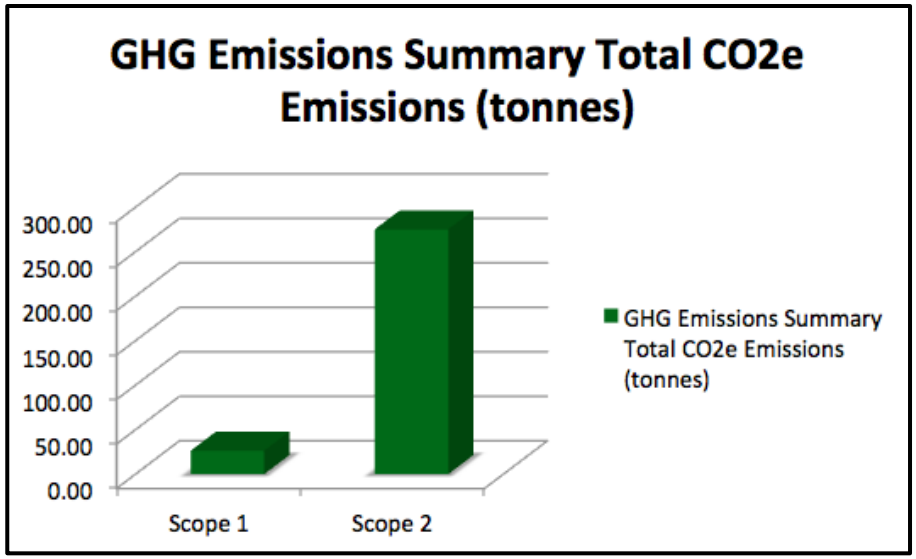
WORLD RESOURCES INSTITUTE

wbcsd

## Emissions Totals

The greenhouse gas emissions attributed to Antioch University Los Angeles campus operations originate from four main sources: natural gas combustion, an on-site backup generator, landscaping related activities and purchased electricity. AULA emitted approximately 301.31 metric tonnes of CO2e during the 2011 calendar year.

Figure 3 represents the comparison of the total CO2e emissions for scope I and scope II sources. It is clear that the emissions resulting from AULA's purchased electricity greatly outweighs that of any on-site or stationary sources.




| | |
|---|---|
| **Total Scope 1 $CO_2e$ Emissions (metric tonnes)** | **26.31** |
| **Total Scope 1 $CO_2e$ Emissions (lbs)** | **57,981.92** |

| | |
|---|---|
| **Total Scope 2 $CO_2e$ Emissions (metric tonnes)** | **275.00** |
| **Total Scope 2 $CO_2e$ Emissions (lbs)** | **604,185.02** |

***Figure 3:*** *Comparison of total CO2e emissions for scope I and scope II sources.*

## Natural Gas

The Corporate Pointe Office Center utilizes an on-site natural gas boiler for heating. The AULA facilities are responsible for a percentage of the total gas consumed by the boiler based upon a breakdown of building square footage. The AULA facilities occupy 26.93% of the Corporate Pointe Office Center. The calculations listed in Figure 4 represent the AULA portion of total energy consumed on the premises.

AULA emissions from natural gas combustion totals 25.79 metric tonnes of CO2e. These emissions also constitute the majority of scope I emissions.

| | Total Energy Consumed (therms) | CO2 Emissions (kg) | CH4 Emissions (kg) | N2O Emissions (kg) | Total CO2e Emissions (tonnes) |
|---|---|---|---|---|---|
| January | 573.82 | 3,056.76 | 0.27 | 0.01 | 3.06525 |
| February | 572.53 | 3,049.88 | 0.27 | 0.01 | 3.05834 |
| March | 434.38 | 2,313.95 | 0.21 | 0.00 | 2.32037 |
| April | 290.31 | 1,546.46 | 0.14 | 0.00 | 1.55075 |
| May | 223.79 | 1,192.12 | 0.11 | 0.00 | 1.19543 |
| June | 373.25 | 1,988.30 | 0.18 | 0.00 | 1.99382 |
| July | 339.32 | 1,807.55 | 0.16 | 0.00 | 1.81257 |
| August | 438.42 | 2,335.47 | 0.21 | 0.00 | 2.34195 |
| September | 399.37 | 2,127.45 | 0.19 | 0.00 | 2.13336 |
| October | 275.49 | 1,467.56 | 0.13 | 0.00 | 1.47163 |
| November | 537.79 | 2,864.82 | 0.26 | 0.01 | 2.87277 |
| December | 369.47 | 1,968.17 | 0.18 | 0.00 | 1.97364 |
| Yearly total | 4,827.95 | 25,718.48 | 2.31 | 0.05 | 25.79 |
| | **totals in lbs** | **56,699.48** | **5.09** | **0.10** | **56,856.90** |
| | **totals in tonnes** | **25.72** | **0.00** | **0.00** | **25.79** |

***Figure 4:*** *Provides total energy consumed during the 2011 calendar year.*

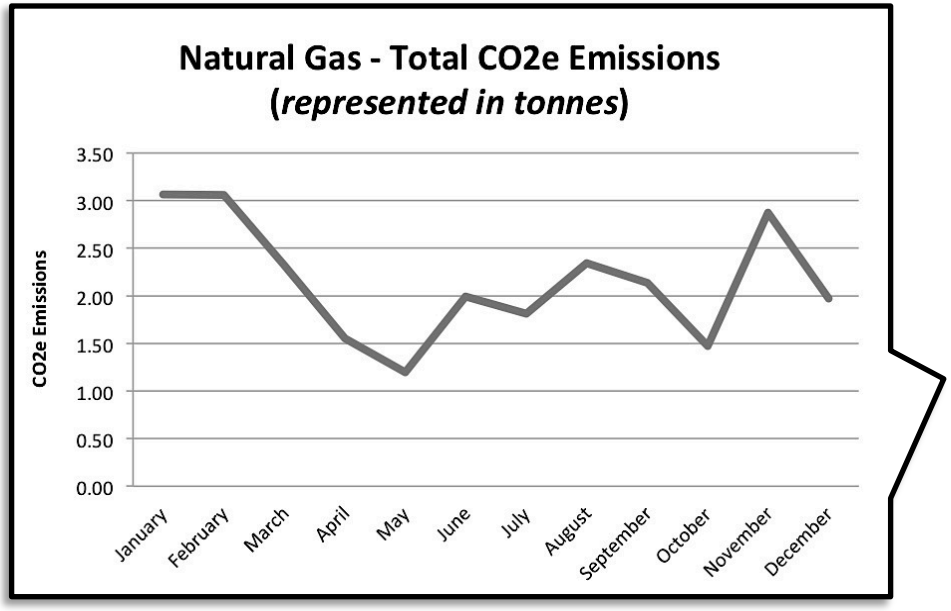



***Figure 5:*** *Depicts the fluctuation of GHG emissions related to natural gas combustion throughout the 2011 calendar year.*

## Emissions through the Year

The Figure 5 depicts the fluctuation of GHG emissions related to natural gas combustion throughout the 2011 calendar year. There is a correlation to local weather patterns, displaying a drop in combustion during the summer months.

## Additional Stationary Sources

The remaining scope I GHG emissions are attributed to the fuel combustion from both an on-site backup generator and the landscaping related activities used to maintain the Corporate Pointe office park. The total energy consumed is noted for both emissions sources. These totals are then used to calculate the percentage allocated to AULA based upon the square footage occupied by the AULA facilities.

## Backup Generator

The backup generator utilized by Corporate Pointe Office Park functions strictly for emergency purposes and all fuel use and related emissions are reported. Figure 6 notes the total gallons of type 2 diesel used by the office park during the 2011 calendar year. The emissions attributed to this source total 0.08 metric tonnes of CO2e.

**Backup Generator**
**Fuel - Type 2 Diesel**

| | Total Energy Consumed (gallons) | CO2 Emissions (kg) | CH4 Emissions (kg) | N2O Emissions (kg) | % allocation to AULA | Total CO2e Emissions (tonnes) |
|---|---|---|---|---|---|---|
| Yearly total | 30 | 304.500 | 0.017 | 0.008 | 26.9% | 0.08 |
| | **totals in lbs** | **585.989** | **0.034** | **0.015** | **26.9%** | **159.20** |
| | **totals in tonnes** | **0.305** | **0.000** | **0.000** | **26.9%** | **0.08** |

***Figure 6:*** *Provides total fuel consumed by the backup generator during the 2011 calendar year.*

## Landscaping

The Office Park employs Brickman, an off-site commercial landscaping company, to maintain the property grounds. The Brickman landscaping equipment utilizes two-cycle engines powered by unleaded gas. Figure 7 notes the total gallons of fuel used for landscaping purposes during the 2011 calendar year. The emissions attributed to this source total 0.44 metric tonnes of CO2e.

**Landscaping Two Cycle Engines**
**Fuel -Unleaded Gasoline***

| | Total Energy Consumed (gallons) | CO2 Emissions (kg) | CH4 Emissions (kg) | N2O Emissions (kg) | % allocation to AULA | Total CO2e Emissions (tonnes) |
|---|---|---|---|---|---|---|
| Yearly total | 182 | 1612.522 | 0.093 | 0.040 | 26.9% | 0.44 |
| | **totals in lbs** | **3554.998** | **0.205** | **0.088** | **26.9%** | **965.82** |
| | **totals in tonnes** | **1.613** | **0.000** | **0.000** | **26.9%** | **0.44** |

***Figure 7:*** *Provides total fuel consumed due to landscaping activities during the 2011 calendar year.*

| | Total Energy Consumed (gallons) | CO2 Emissions (kg) | CH4 Emissions (kg) | N2O Emissions (kg) | Total CO2e Emissions (tonnes) |
|---|---|---|---|---|---|
| January | 83,838.95 | 25,897.82 | 1.07590 | 0.23698 | 25.99533 |
| February | 79,420.26 | 24,532.89 | 1.01919 | 0.22449 | 24.62526 |
| March | 71,217.34 | 21,999.01 | 0.91393 | 0.20130 | 22.08184 |
| April | 70,590.35 | 21,805.33 | 0.90588 | 0.19953 | 21.88744 |
| May | 72,348.11 | 22,348.30 | 0.92844 | 0.20450 | 22.43245 |
| June | 76,961.46 | 23,773.36 | 0.98764 | 0.21754 | 23.86288 |
| July | 70,928.96 | 21,909.93 | 0.91022 | 0.20049 | 21.99243 |
| August | 69,599.03 | 21,499.11 | 0.89316 | 0.19673 | 21.58006 |
| September | 76,961.06 | 23,773.24 | 0.98763 | 0.21754 | 23.86276 |
| October | 75,920.55 | 23,451.83 | 0.97428 | 0.21460 | 23.54013 |
| November | 77,490.01 | 23,936.63 | 0.99442 | 0.21903 | 24.02676 |
| December | 61,629.02 | 19,037.18 | 0.79088 | 0.17420 | 19.10886 |
| Yearly total | 886,905.09 | 273,964.61 | 11.38 | 2.51 | 275.00 |
| | **totals in lbs** | **603,991.24** | **7.75** | **0.00** | **604,185.02** |
| | **totals in tonnes** | **273.96** | **0.01** | **0.00** | **275.00** |

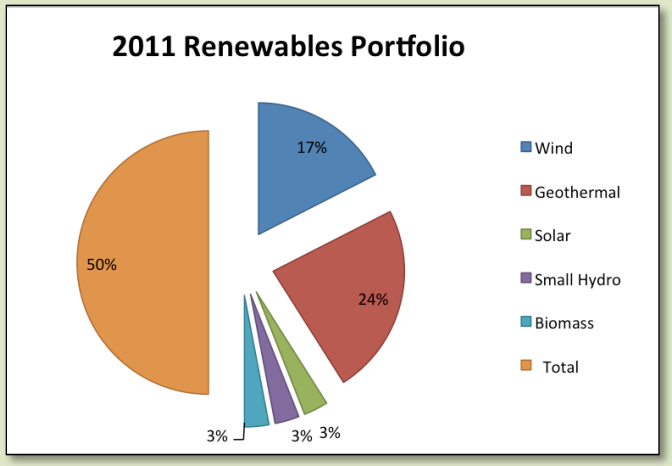
***Figure 8:*** *Provides the total electricity purchased during the 2011 calendar year.*

## Purchased Electricity

The Corporate Pointe Office Center purchases electricity from Southern California Edison. The AULA facilities are metered to record electricity use by the University. AULA is also responsible for a percentage of the shared electricity usage for the office center based upon the amount of space occupied. The calculations listed in Figure 8 represent the AULA portion of total electricity purchased for the office center. The scope II CO2e emissions attributed to purchased electricity totals 275 metric tonnes. These emissions also constitute the clear majority of GHG emissions resulting from all AULA operations accounted for in this inventory report.

Figure 9 depicts the fluctuation of GHG emissions related to purchased electricity throughout the 2011 calendar year.

## RENEWABLE RESOURCES




Southern California Edison (SCE) is one of the nation's largest purchaser of renewable energy, buying and delivering approximately 13 billion kilowatt hours (kWh) from wind, solar, biomass, geothermal and small hydro suppliers—almost 16 percent of the power delivered to customers.

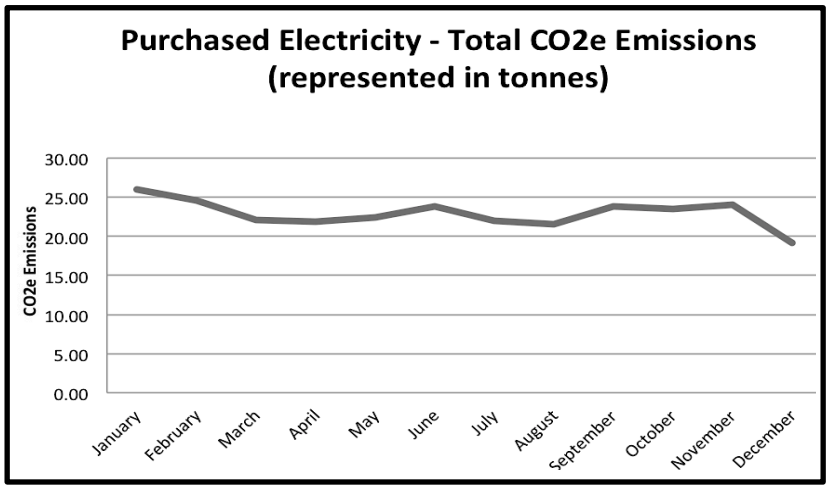



***Figure 9:*** *Depicts the fluctuation of GHG emissions related to electricity purchased throughout the 2011 calendar year.*

## Next Steps

Future AULA GHG emissions data will be reported to the ACUPCC on an annual basis. Going forward, the 2011 Inventory Management Plan (IMP) will serve as the guiding methodological tool for inventory data collection and reporting.

## Base Year

The 2011 Inventory is the designated baseline emissions level and will be used for future AULA GHG Inventories. Future growth in the AULA community will not impact the base year. AULA will work to develop a climate action plan with the aim of moving towards carbon neutrality.

## Adjustments & Methodology Changes

Should WRI update its GHG emissions factors in a future iteration of the protocol, the new emissions factors will be applied retroactively to the previous years' calculations.

Currently, AULA does not own its own facilities. Should a time come when it does own its own space, a determination will be made whether to switch from operational to financial control. Switching methodologies at a future date will necessitate defining a new base year.