

# The Lynn University Carbon Footprint and Analysis

## Baseline Report

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## **Executive Summary**

The Lynn University Carbon Footprint Project was started to monitor progress of the Lynn Sustainability Plan, LynnPact 2030, now known as Lynn University Going Green. Understanding our progress meant first understanding where we were as an institution. This report is a comprehensive inventory of greenhouse gas (GHG) emissions by Lynn University. The carbon footprint has historically been defined as the total set of greenhouse gas (GHG) emissions caused by an organization, event, product or person. The carbon footprint for the University is a derived number calculated from a large amount of data expressed in carbon dioxide equivalent (CO<sub>2</sub>e) per student and/or per 1000 square foot (sq.ft.) of operating space. This report establishes a baseline year (2009) and a corresponding carbon footprint to be used with future reports to monitor Lynn University's sustainability progress.

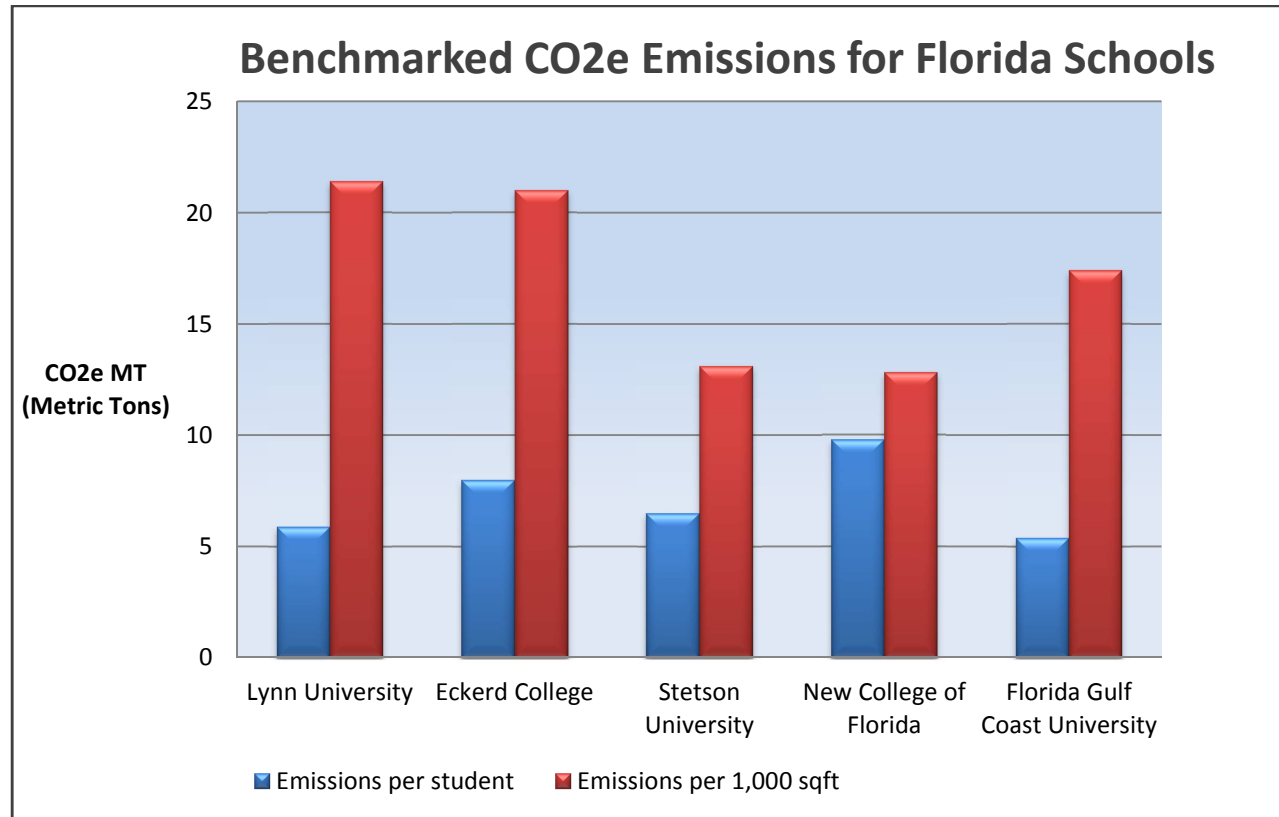
Lynn University Going Green is a comprehensive approach to achieve sustainability goals of: reducing GHG emissions toward; a 50% reduction from our baseline (2009) by 2030, improving and modernizing the University, and increasing the size of the University while containing costs by intelligent use of improvements in five focus areas. The focus areas are:

- Energy systems • Water systems • Landscape & Ecology • Waste & Materials
- Community & Education.

This plan is implemented through our own staff and the use of consultants and contractors. To calculate the carbon footprint, the carbon team chose the "Carbon Calculator v6.7" from the Clean-Air, Cool Planet website as it is used by over 2000 universities to monitor and track their carbon footprint. Using this calculator provides Lynn University with the ability to benchmark current performance against other institutions, but it also allows us to model proposed changes and predict the effects as well as monitor the progress the changes have actually had. Our Energy Performance

partner, Siemens Inc., provided a proposal which modeled our GHG emissions, and the work here is a validation of their work (included later in the report) with more detailed and comprehensive information. Our results generated by independently gathering the data needed for the University's Carbon Footprint for the year 2009 and 2011 and benchmarked against other South Florida schools are shown below.

Figure 1 Lynn University benchmarked CO<sub>2</sub>e per student and per 1000sqft to other ACUPCC schools



\*This graph used the best available data; however, 2009 data was not available for Eckerd College, Stetson, or the New College of Florida. 2008 data was used in place of 2009 data.

Lynn University was at 6.0 metric tons CO<sub>2</sub>e per student FTE (full-time equivalent) compared with Eckerd College (8.0 mtCO<sub>2</sub>e per student FTE), Stetson University (6.5 mtCO<sub>2</sub>e per student FTE), New College of Florida (9.8 mtCO<sub>2</sub>e per student FTE) and Florida Gulf Coast University (5.4 mtCO<sub>2</sub>e per student FTE).

Lynn University was at 21.4 CO<sub>2</sub>e per 1000sqft, Eckerd was 21.0 CO<sub>2</sub>e per 1000sqft, Stetson was 13.1 CO<sub>2</sub>e per 1000sqft, New College of Florida was 12.8 CO<sub>2</sub>e per 1000sqft and Florida Gulf Coast University was 17.4 CO<sub>2</sub>e per 1000sqft.

Lynn University was at 21.4 CO<sub>2</sub>e per 1000sqft in 2009, it is reflective of operational efficiency, which is determined by; age of the buildings, square footage of space and operational efficiencies such as building equipment. Newer facilities will have better efficiencies and lower GHG emissions numbers.

GHG emissions values for the benchmarked schools are published in the American College and University President's Climate Commitment (ACUPCC) Reporting System. Information for the schools listed in Table 1 are included in the appendix of this report. While the best available data was used there are pieces of information not consistent through each university's calculation of their Carbon Footprint. Some reports are from 2008 and some are from 2009. A list of sources for the information is provided in the appendix, and the data entered in the "calculator" is footnoted for source traceability.

To help put into perspective the amount of GHGs Lynn University was emitting in 2009 the carbon team made use of the US EPA's carbon equivalency calculator.

Lynn University's 2009 carbon emissions were equivalent to:

- Burning 66.5 railcar loads of coal
- 2,394 passenger cars on the road for 1 year
- The annual emissions from electricity use of 1,522 homes

In contrast, Lynn University's carbon emissions can be abated by:

- Recycling 4,253 tons of waste instead of sending it to the landfill
- The carbon sequestration of 2,603 acres of pine or fir forests

Potential improvements to the campus or projects aimed at reducing our GHG emissions can be modeled using the Carbon Calculator v 6.7 to determine their effectiveness. After some review of the data potential projects could be:

1. Reduce the amount of purchased electricity used by starting a "turn off the lights" campaign.
2. Purchase recycled paper and use Eco Fonts on copiers.
3. Reduce solid waste amounts by improving segregation of recyclable materials.
4. Reduce NO<sub>2</sub> emissions by using organic fertilizer instead of synthetic fertilizers.
5. Improve Energy efficiency:
  - a. Purchase energy star appliances including TVs, computers, refrigerators, projectors, and other electronic devices.
  - b. Use window overhangs and/or reflective film coatings on windows to reduce solar heat gain thereby reducing cooling load.
  - c. Use light colored roofing materials to reduce solar heat gain thereby reducing cooling load.
6. Purchase electric/hybrid vehicles when existing campus vehicles are up for lease renewal or need replacement.
7. Reduce commuting miles driven (in 2011 more than 4.2 million miles annually) by increasing carpooling using the information gathered in this report. This can be done by notifying commuters within the same zip code of others drivers in their area, increasing the chances that they will carpool.

8. Reduce methane emissions by reducing water consumption (500 metric tons of water = 100 metric tons of methane).

\*Some energy efficiency upgrades and conservation projects are already underway, so upgrading lighting fixtures and changing water fixtures was not included in this list.

\*An analysis of the listed projects was not included in this report, but may be worth additional research.

### **Challenges Lynn University may still face**

1. Lynn University has a high percentage of International students, and as such, our population has higher than normal airline travel. The calculated CO<sub>2</sub>e values for transportation to and from international student homes for semester beginning and end are not included. Also students that study abroad outside of J-term were not added to GHG emission calculations.
2. Facility efficiency may not improve with age, climate, or other factors, making it difficult to improve GHG emissions per 1,000 sqft.

The next step is to monitor the Lynn University Carbon Footprint and report on an annual basis the progress of the Lynn University Going Green efforts. Continued monitoring is essential to understanding the increase or decrease of Lynn University's carbon emissions and progress towards Lynn's sustainability goals, which become increasingly complex as we continue to grow in population and building square footage. Monitoring could be done by creating a team of faculty, students and/or consultants to perform this audit on an annual basis.

Publicly reporting GHG inventories and/or sustainability efforts can be a marketing tool for the school's commitment to sustainability. Several organizations currently exist to publish GHG inventories and assist in the public reporting of sustainability efforts for universities. AASHE's STARS program or the ACUPCC both offer the opportunity to publicly report Lynn University's sustainability efforts. However, there are association fees and implementation costs for both organizations which would need to be considered. The public reporting of Lynn University's sustainability efforts is not discussed in detail here but may be in a later report in the future. A public reporting program would have to be developed within Lynn University and submitted for administrative approval.