Conducting a Greenhouse Gas Inventory
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Abstract
Institutions of higher education are becoming more interested in quantifying their carbon footprints. Many colleges and universities have started measuring this by conducting a Greenhouse Gas (GHG) Inventory. For many, the catalyst for change occurs through the signing of the American College and University Presidents’ Climate Commitment (ACUPCC). In the case of Saint Louis University (SLU), the process was initiated as a starting point for creating a baseline for the Sustainability Tracking, Assessment & Rating System (STARS) report.

The experience with the GHG Inventory at SLU not only shows the immensity of resources used by the University, but also the immensity of conflating all the data into one document for the open viewing. The hope for conducting this GHG Inventory is to effectively communicate this immensity and use that as a motivator for change.

Methods
The completion of the GHG Inventory and Report was a two-fold process consisting of data gathering and second of data conflating.

Data Gathering
All information comprised in the inventory was guided by the CarbonMAP, which then calculated data behind the scenes to show total emissions and CO₂-e (carbon dioxide equivalent).

All data requirements were met by either collection from existing sources or from simple in-house communications and outreach techniques.

Some data gathered required calculations and extrapolations to achieve exact numbers (transportation survey and University travel).

Data Conflating
Given the large amount of data, not all could be included in the final report. The process of whittling down content for the inventory required back and forth team efforts.

Most quantitative data was compiled into tables and chart to be collected in the appendices of the report.

Decisions on which information should be made public in the report were carefully assessed; full transparency is desired, but the breadth of data does not allow this.

Summary Statistics

<table>
<thead>
<tr>
<th>FY14 Metrics</th>
<th>Total</th>
<th>Per Campus User</th>
<th>Per Student</th>
<th>Per 1,000 Square Feet</th>
<th>% Offset</th>
</tr>
</thead>
<tbody>
<tr>
<td>Gross Emissions</td>
<td>153,407.70</td>
<td>19.02</td>
<td>12.87</td>
<td>26.92</td>
<td>0%</td>
</tr>
<tr>
<td>Net Emissions</td>
<td>153,407.70</td>
<td>19.02</td>
<td>12.87</td>
<td>26.92</td>
<td>N/A</td>
</tr>
</tbody>
</table>

As shown above, SLU currently has 0% carbon offsets. During the spring 2015 semester, the University is installing 25 kW solar arrays on 9 campus buildings. This is an example of one of many positive steps SLU could take toward decreasing net carbon emissions.

Results & Conclusions
In FY14, SLU’s total GHG emissions were approximately 153,408 metric tons of CO₂-e.

• The average per capita GHG emissions equaled 12.87 tons CO₂-e per student FTE.
• In comparison with doctorate-granting university ACUPCC signatories, SLU’s emissions per student FTE was 79% greater than the peer average, but emissions per 1,000 square feet was only 35% above the group.

Introduction
A greenhouse gas (GHG) inventory is a comprehensive analysis of all emissions created from energy used by an institution.

• This is the first-ever greenhouse gas inventory completed for SLU.
• This inventory will serve as the baseline for all following GHG inventories and provide the University a tool to track all GHG usage through the years.
• The data for the inventory was entered into a web-based campus carbon calculator, the CarbonMAP – Management and Analysis Platform, recommended by AASHE STARS1.
• The GHG Inventory at SLU has a couple of unique features about it to learn from:
  ○ It was lead by a graduate student who had no previous advanced knowledge of energy systems, and a project analyst who contributed intimate knowledge of the University’s Facilities Services Department.
  ○ A substantial portion of the needed inventory data was already collected in some fashion through Facilities Services’ dashboard, a centralized repository of performance indicators.

1 Association for the Advancement of Sustainability in Higher Education – Sustainability Tracking, Assessment, & Rating System

Challenges & Obstacles for Consideration
Beginning challenges:
• Starting the process as experiential learning for a graduate student and then partnering with a Facilities Services employee, as further team support was needed.
• The overwhelming amount of background learning needed to understand components of a GHG inventory.
• Finding energy information (ex – T&D loss and emissions factors).
• Learning where to find data and what data did not exist.

Later challenges:
• Conflation of large amount of information.
• Determining overall goal of GHG inventory, which would determine the depth and content of the report.
• Lack of cooperation from select departments in data sharing.

Acknowledgments
Support for the completion of the GHG inventory came from a variety of contacts, specifically from individuals in Facilities Services at SLU.