Chapman University
Sustainability Solutions

FY19 GHG Benchmarking Presentation

September 16th, 2020

Duncan Ketel and Tiffany Smith
What We Do

Operations

Construction

Procurement

Planning

Design

Data
Drive Meaningful Action

Software
Improve Workflows

Expertise
Deliver Results
Sightlines Solutions

FACILITIES BENCHMARKING & ANALYSIS
Take control of your facilities and make the case for change without the guesswork

FACILITIES ASSESSMENT & PLANNING
Plan and execute capital investment plans that are inclusive, credible, flexible, affordable and sustainable

SPACE UTILIZATION
Ensure your space is working up to its full potential

SUSTAINABILITY SOLUTIONS
Measure, compare and improve environmental stewardship
At the end of 2017, Gordian entered into a partnership with the Sustainability Institute at the University of New Hampshire, ensuring our Sustainability Solutions are always based on the most up-to-date science and methods.

They host *Sustainability Indicator Management & Analysis Platform* (SIMAP). This is a carbon and nitrogen-accounting platform that tracks and analyzes campus-wide sustainability based on nearly two decades of work supporting campus inventories.
Components of Emissions Profile

Scope 1: Direct GHGs
- On-Campus Stationary Fuel
- Vehicle Fleet Fuel
- Fertilizer
- Refrigerants

Scope 2: Upstream GHGs
- Purchased Electricity

Scope 3: Indirect GHGs
- Commuting
- Directly Financed Travel
- Solid Waste
- Paper Purchasing
- Transmission & Distribution Losses
Prior to FY18/19 Chapman’s emissions were relatively consistent.

Longitudinal Emissions

Total Emissions increased by 7%
Progress Against 2014 Baseline

Chapman’s total emissions have been minimally impacted by increases in space and FTE’s.

Change in Emissions (MTCDE) vs. Campus Size and Population (FTE)
Indexed to FY2014

Change in Space, Population, and Emissions
Indexed to FY2014

<table>
<thead>
<tr>
<th>Year</th>
<th>Space</th>
<th>Population</th>
<th>Total Emissions</th>
<th>MTCDE/FTE</th>
<th>MTCDE/1,000 GSF</th>
</tr>
</thead>
<tbody>
<tr>
<td>2014</td>
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<td>2015</td>
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<td>2019</td>
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</table>
FY19 Distribution of Emissions by Level of Control

Purchased electricity, commuting and travel make up the majority of emissions.
Sustainability Peers
Peers determined using location, campus size, and population

<table>
<thead>
<tr>
<th>Peer Institution</th>
<th>Location</th>
</tr>
</thead>
<tbody>
<tr>
<td>The Thacher School</td>
<td>Ojai, California</td>
</tr>
<tr>
<td>California Institute of the Arts</td>
<td>Santa Clarita, California</td>
</tr>
<tr>
<td>St. Mary’s College of California</td>
<td>Moraga, California</td>
</tr>
<tr>
<td>University of San Francisco*</td>
<td>San Francisco, California</td>
</tr>
<tr>
<td>University of San Diego*</td>
<td>San Diego, California</td>
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<tr>
<td>University of Denver</td>
<td>Denver, Colorado</td>
</tr>
<tr>
<td>University of Texas – Rio Grande Valley</td>
<td>Edinburg, Texas</td>
</tr>
</tbody>
</table>

*Chapman institutional peers
Two Ways to Normalize Emissions for Comparison

**GHG Emissions per 1,000 GSF EUI Adjusted**

- Stresses intensity of operations.
- Gross GHG Emissions
  - EUI Adjusted GSF
  - X 1,000

**GHG Emissions per Weighted Campus User**

- Stresses efficient use of space.
- Gross GHG Emissions
  - Weighted Campus User
Total Gross Emissions per Space and Campus User

Gross Emissions
MTCDE/1,000 EUI – Adjusted Floor Area

- **Scope 1**
- **Scope 2**
- **Scope 3**
- **Peer Average**

Gross Emissions
MTCDE/Weighted Campus User

- **Scope 1**
- **Scope 2**
- **Scope 3**
- **Peer Average**

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Scope 1: Direct Emissions

Chapman’s scope 1 emissions are significantly below peer average when normalized.
Scope 1: Stationary Fuel Consumption

FY18/19 saw a 47% increase in natural gas consumption from prior year.
Scope2: Total Electric Consumption vs. Peers

Chapman relies on purchased KWH, while peers diversify their source of Scope 2 consumption.

Chapman has decreased KWH consumption by 20%.
Scope 2: Total Electric Consumption vs. Peers

Chapman consumed less than peer average in FY18/19

Peers arrayed by technical complexity; The relative mechanical complexity of the campus on a scale of 1-5
Scope 2: Total Electric Consumption vs. Peers

Chapman consumed less than peer average in FY18/19

FY19 Electric Consumption vs. Peers
Cooling Degree Day Normalized Using National Average for FY18/FY19

Peers arrayed by technical complexity; The relative mechanical complexity of the campus on a scale of 1-5
Energy Emissions vs. Peers

When normalizing by square footage, Chapman has seen energy emissions decrease by 30% since 2014.

Energy Emissions

- Chapman vs. Peers
  - Chapman: -30% decrease since 2014
  - Peers: 3% increase since 2014

Scope 1 and Scope 2 emissions are shown for each year from 2014 to 2019.
Scope 3: Indirect Emissions Overview

Commuting and travel are largest proportions of Scope 3 emissions

FY19 Scope 3 Emissions

Scope 3 Emissions vs Peers

Paper data was extrapolated for all years from FY17
Normalized Wastewater Production

Chapman produces less wastewater than peers

![Water Emissions vs. Peers](image-url)
Scope 3: A Closer Look at Waste

Chapman produces more waste, but diverts more than peers

Waste Diversion Rates vs. Peers

FY19 Waste vs Peers

Other Diversions
Compost
Recycling
Landfilled wasted
Peer Average

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Scope 3: Commuting Profile

Comparing Chapman commuting modes to peers and database

Commuting Mode by Demographic

<table>
<thead>
<tr>
<th>Chapman Students</th>
<th>Peer Students</th>
<th>Database</th>
<th>Chapman Faculty/Staff</th>
<th>Peer Faculty/Staff</th>
<th>Database</th>
</tr>
</thead>
<tbody>
<tr>
<td>Drive alone</td>
<td>Carpool/Mass Transit</td>
<td>Carbon Free</td>
<td>Drive alone</td>
<td>Carpool/Mass Transit</td>
<td>Carbon Free</td>
</tr>
<tr>
<td>57%</td>
<td>37%</td>
<td>7%</td>
<td>83%</td>
<td>2%</td>
<td>3%</td>
</tr>
<tr>
<td>37%</td>
<td>17%</td>
<td>22%</td>
<td>8%</td>
<td>12%</td>
<td>15%</td>
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<tr>
<td>23%</td>
<td>8%</td>
<td>7%</td>
<td>8%</td>
<td>1%</td>
<td>2%</td>
</tr>
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Scope 3: Total Commuting Emissions

Chapman’s commuting emissions continue to rise, but remain below peer average
Scope 3: Total Travel Emissions

Chapman’s travel emissions continue to rise, but remain below peer average
Paper Profile

Chapman consumes more paper and emits more than peer averages

FY19 Paper Consumption vs. Peers

<table>
<thead>
<tr>
<th>LBS./WCU</th>
<th>Paper Usage</th>
<th>Peer Average</th>
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Paper Emissions vs. Peers

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Key Takeaways/Recommendations

Scope 1: Chapman should continue to prioritize energy efficiency upgrades and continue to use aggressive thermostat set points. Additionally, improve internal policies to track refrigerants.

Scope 2: Chapman should diversify their electricity sources by investing in solar and continue to invest in energy efficiency upgrades.

Scope 3: Instituting a carbon offset strategy for study abroad and directly financed travel and sending out an annual sustainability survey to track student commuting and opinions around campus sustainability.