Chapman University
Sustainability Solutions

FY19/20 GHG Benchmarking Update

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Duncan Ketel and Tiffany Smith
What We Do

Operations

Planning

Construction

Design

Procurement

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
Sustainability Solutions Agenda

Overview of Sightlines Data Analysis

Summary of Emissions Profile

Scope 1 Emissions Overview

Scope 2 Emissions Overview

Scope 3 Emissions Overview
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
Longitudinal Emissions by Scope

Chapman’s emissions were similar to baseline year of analysis
Progress Against 2014 Baseline

Chapman’s total emissions have been minimally impacted by increases in space and FTE’s.
FY20 Distribution of Emissions by Level of Control

Purchased electricity, commuting and travel make up the majority of emissions

**Scope 1 Sources – 13%**
- On-Campus Stationary: 3,000
- Refrigerants & Chemicals: 207
- Fleet Fuel: 414

**Scope 2 Sources – 37%**
- Purchased Electricity: 10,087

**Scope 3 Sources – 50%**
- Commuting: 4,103
- Travel: 5,950
- Waste: 2,969
- Paper Purchases: 309
- T&D Losses: 509
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>
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<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>
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<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>
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<tr>
<td>Nova Southeastern University</td>
<td>Fort Lauderdale, Florida</td>
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</tbody>
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Two Ways to Normalize Emissions for Comparison

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

Stresses intensity of operations.

\[
\frac{\text{Gross GHG Emissions}}{\text{EUI Adjusted GSF}} \times 1,000
\]

**GHG Emissions per Weighted Campus User**

Stresses efficient use of space.

\[
\frac{\text{Gross GHG Emissions}}{\text{Weighted Campus User}}
\]
Total Gross Emissions per Space and Campus User

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

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

Chapman’s natural gas consumption continues to increase from historic FY17/18 low.
Scope2: Total Electric Consumption vs. Peers

Since FY18/19 Chapman’s electric consumption has been comparable to peers.

Chapman has decreased KWH consumption by 18%.
Scope 2: Total Electric Consumption vs. Peers

Chapman relies solely on purchased KWH, but consumption is equivalent to peers.

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 peers when normalized by CDD in FY19/20

**FY20 Electric Consumption vs. Peers**

*Normalized by Cooling Degree Days*

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

Chapman has seen total energy emissions decrease at a greater rate than peers.

26% decrease since 2014

12% decrease since 2014
Scope 3: Indirect Emissions Overview

Commuting, Travel, and Waste are largest proportions of Scope 3 emissions
Normalized Wastewater Production

Chapman produces less wastewater than peers

Water Emissions vs. Peers

Gallon/WCU

<table>
<thead>
<tr>
<th>A</th>
<th>B</th>
<th>CU</th>
<th>C</th>
<th>D</th>
<th>E</th>
<th>F</th>
<th>G</th>
</tr>
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<tbody>
<tr>
<td>16,000</td>
<td>14,000</td>
<td>12,000</td>
<td>10,000</td>
<td>8,000</td>
<td>6,000</td>
<td>4,000</td>
<td>2,000</td>
</tr>
</tbody>
</table>

Wastewater

Peer Average
Scope 3: A Closer Look at Waste

Chapman diverts more waste than peers, and produces less waste per user.

FY20 Diversion rate vs Peers

- CU: 47% Other Diversions, 57% Recycling
- Peers: 27% Other Diversions, 5% Recycling

FY20 Waste vs Peers

- CU: 12% Compost, 4% Landfilled waste
- Peers: 4% Compost, 10% Landfilled waste

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Scope 3: Commuting Profile

Comparing Chapman commuting modes to peers and database

Commuting Mode by Demographic

- Chapman Students: 57% Drive alone, 35% Carpool/Mass Transit, 8% Carbon Free
- Peer Students: 74% Drive alone, 18% Carpool/Mass Transit, 8% Carbon Free
- Database: 70% Drive alone, 22% Carpool/Mass Transit, 7% Carbon Free
- Chapman Faculty/Staff: 83% Drive alone, 8% Carpool/Mass Transit, 2% Carbon Free
- Peer Faculty/Staff: 85% Drive alone, 12% Carpool/Mass Transit, 15% Carbon Free
- Database: 82% Drive alone, 15% Carpool/Mass Transit, 3% Carbon Free

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Scope 3: Total Commuting Emissions

Reduction of time spent on campus correlates to reduction in commuting emissions

Commuting Emissions

- MTDE: MTCDE
- 2014 to 2020: Data for MTCDE and MTCE/WCU for both student and employee commuting.

Normalized Commuting Emissions

- 2014 to 2020: Data for normalized MTCDE/WCU with a pre-FY20 average line.
Scope 3: Total Travel Emissions

While travel was suspended in March, emissions increased from FY19 to FY20.
Paper Profile

Chapman consumes more paper and has higher paper related emissions than peers.