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## Colby College 2016-17 Sustainability Overview

Colby College

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## 2016-17 Sustainability Overview

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### Campus Sustainability Program Recognition

Colby's sustainability program has earned several accolades that affirm and reflect continued progress in the College's commitment to institutionalize sustainability in academics and campus operations.

The Association for the Advancement of Sustainability in Higher Education (AASHE) STARS Rating System is the premier framework for evaluating campus sustainability. Of 851 participating higher education institutions around the world, Colby currently has the 21<sup>st</sup> highest score and a Gold rating. In 2017, Colby was ranked 9<sup>th</sup> by the Sierra Club in its annual Cool Schools assessment of college and university sustainability. Colby also earned a top spot on the Princeton Review Green College Honor Roll as one of only 24 schools nationally to earn the highest possible score of 99 points.

### Campus Engagement

#### **EcoRep Program**

The student EcoRep program is in its fourth year and in fiscal 2017 the team contributed over 1,800 hours to promote sustainability action on campus. Thirty EcoReps were engaged throughout the year performing two major functions: (1) promoting sustainable living habits in the residence halls; and (2) planning, managing and executing student-focused sustainability projects to generate environmental discussion and action across campus.

EcoReps focused on educating the residence hall community on sustainable living practices, and continued campaigns to conserve campus resources. The following are some highlights from the year.

Dorm Electricity Challenge: Over the three-week competition, 23 of 25 residence halls had a reduction compared to the baseline period, for a savings of approximately 18,677 kWh. This represents a reduction of 13 percent across all residence halls and is **double the savings achieved during last year's competition.**

5-Minute Shower Challenge: Campus-wide participation continued to grow approximately 5 percent per year, reaching 31 percent in fiscal 2017. The winning dorm, Treworgy, had a 60 percent participation rate.

kNOw Your Waste: This team worked to develop a technology-based tool to reduce food waste in the dining halls. Their approach would provide individualized food waste data to students and provide incentives for reducing waste. They pitched their idea at the 2<sup>nd</sup> Annual Maine Food System Innovation Challenge and were awarded second place, a prize of \$1,000.

Small Projects: The Small Projects team was new in fiscal 2017 and allowed students to develop solutions to self-identified sustainability issues on campus. The inaugural team undertook a variety of initiatives including the design of an EcoReps t-shirt and installation of faucet aerators across campus. They also managed the Sustainability Kit program, which allows students to borrow clothes-drying racks and compost bins for use in their dorms at no cost.

### **Sustainability and Green Building Education**

In January 2017, the Sustainability Office offered a three-credit course entitled Green Building Design to 20 Colby students. The course provided an introduction to building science and design, and provided students with methods to analyze and measure sustainability performance. Lab assignments and homework aimed to promote the campus as a living laboratory and help students better understand interactions between the built and natural environment.

### Operations Pilot Programs

#### **Sustainable Turf Management**

In fiscal 2016 the College began a pilot sustainable turf management program on the Dana and the Roberts Row terrace lawns, which will continue through fiscal 2018. Based on an analysis of soil composition in each area, additional nutrients are applied to increase root depth of the grass and restore soil microorganisms. This process aims to improve soil health and grass quality, prevent weed growth, reduce

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watering needs, and to reduce the use of synthetic fertilizer and pesticides. Following a successful pilot project, additional areas on campus will transition to these management practices.

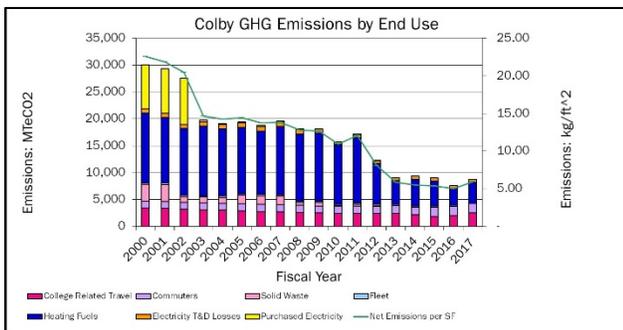
**Native Plantings**

To reduce unnecessary irrigation and mowing, the grounds staff have identified several areas on campus to transition from traditional turf to alternative native plantings. The Cotter Drive now boasts a bed of native plantings as does the area around the newly-expanded Grossman Hall. The species for each area were selected based on soil type, acidity, moisture, and light levels. Native plantings should have more success due to their ability to subsist and thrive in the local climate, and require much less maintenance. They will also support pollinators and provide more diverse environmental experiences for the campus community. The plant spacing in the beds allows for growth and will fill out after several growing seasons. Other areas of campus are being considered for future transition to native plantings; in addition lower maintenance requirements, these alternatives provide educational opportunities and continue to develop the campus as a living laboratory.

**Greenhouse Gas Emissions**

**Campus Greenhouse Gas Progress**

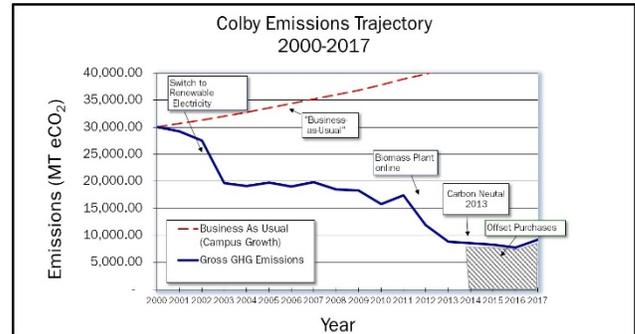
The following chart shows Colby's greenhouse gas (GHG) reduction progress since 2000.



**Figure 1:** Colby College GHG Emissions progress since 2000

Major reductions have resulted from the purchase of renewable electricity in 2002, the opening of the biomass plant in 2011, the purchase of carbon offsets beginning in 2013, and regular investment in energy conservation projects. More information on these is included in the next section.

In fiscal 2017, emissions increased to 9,208 MTCDE, a modest increase reflecting a colder winter and campus growth. These emissions were offset through the purchase of carbon-offset credits (Figure 2).



**Figure 2:** GHG Emissions trajectory

**Carbon Offset Details**

The College evaluated proposals from six carbon offset vendors for national and international offset projects that attained third party certification, met the College's environmental and social goals, and were priced competitively. In fiscal 2017, an effort was made to align the carbon offset project benefits with the United Nations Sustainable Development Goals. Projects were evaluated based on their impact on biodiversity, climate adaptation, the local economy, education, job creation, water resources, financial security, food security, health, infrastructure, and empowerment of women. Colby purchased carbon offsets for fiscal 2017 from two locations.

The first, a household and agricultural biogas program in Vietnam, prevents the release of methane into the atmosphere and provides organic fertilizer for agricultural use. Methane has a global warming potential 21 times greater than that of carbon dioxide. Additionally, the project benefits span 10 of the 12 sustainable impact categories.

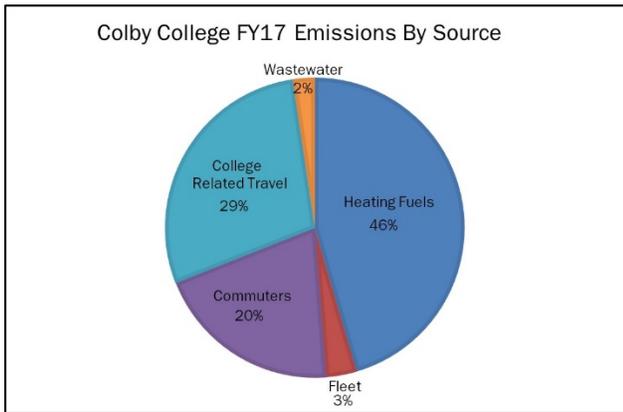
The second, a project in Guatemala, distributes water filters and stoves that enable access to clean water and improve indoor conditions by improving indoor air quality and increased fuel efficiency. Two key benefits resonated with Colby's Environmental Advisory Group (EAG): job creation and the empowerment of women. The CarbonNeutral Company estimates that 800 temporary and permanent staff are hired to manufacture and install the stoves and train families in their use. The stoves burn fuel more efficiently, reducing the amount of fuel burned and the time needed to collect wood and cook, allowing women (the primary cooks in Guatemala) to reallocate time and energy to other activities.

While the College will invest in carbon offsets to maintain its carbon neutral distinction, Colby will also continue to implement energy conservation projects, enhance recycling and composting efforts, and explore other greenhouse gas reduction projects on campus.

**Fiscal 2017 Greenhouse Gas Emissions Breakdown**

Figure 3 depicts the proportion of remaining GHG emissions from the fiscal 2017 inventory. Heating fuels comprise the largest amount of emissions, at approximately 46 percent. College travel comprises 29 percent of the remaining emissions. Air travel is the largest contributor and equals nearly 2,300 MTCDE of the total 9,208 MTCDE. Commuting forms the third largest share of the College’s emissions and comprises 20 percent of the total. A commuter survey conducted in the fall of 2014 helped quantify commuting emissions and evaluate commuter greenhouse gas reduction projects moving forward. An updated transportation survey is planned for fiscal 2018.

Colby is seeking to further reduce emissions by implementing efficiency measures in new and existing facilities, evaluating renewable energy installations and exploring methods to reduce Scope 3 emissions.



**Figure 3:** Colby College GHG emissions breakdown for fiscal 2017

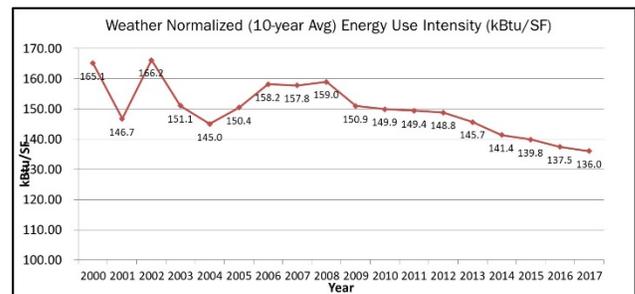
**Fiscal 2017 Key Sustainability Indicators**

Energy

Since 2000, Colby College has realized a substantial reduction in its energy consumption. Figure 4 shows the weather normalized energy use per square foot from 2000 through 2017. The energy data have been corrected for heating degree days to allow comparison from one year to the next.

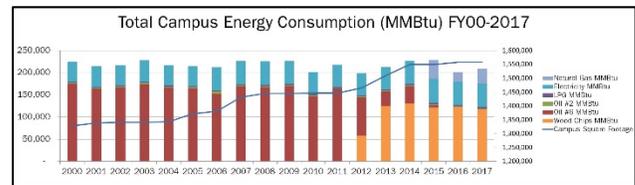
Since 2000, the College has realized an 18 percent reduction in its weather-normalized energy consumption per square foot. In reviewing the data, there is a small anomaly from 2004–2006, when the Colby Green was created, adding significant exterior lighting without any corresponding increase in campus square footage. Since then, consumption has decreased with the construction of more efficient buildings, renovations, and upgrades to individual building systems.

Further efficiency gains stem from the beginning of Colby’s Energy Management program, which aims to reduce energy consumption by 20 percent per square foot over the next six years, using fiscal 2014 as a baseline. In terms of total energy consumption, without weather normalization, the goal is to maintain campus energy consumption, inclusive of campus growth over the same time period.



**Figure 4:** Weather-normalized campus energy consumption per square foot since 2000

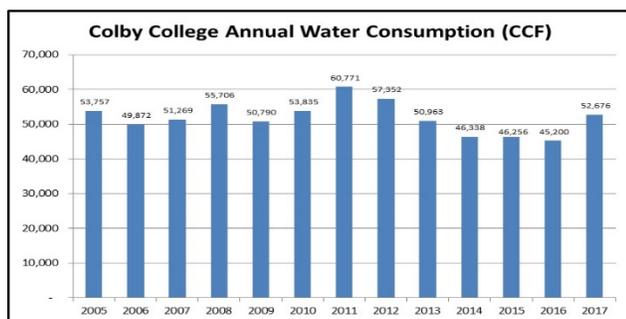
Figure 5 displays the total energy consumption per square foot by utility type. Consumption of #6 oil has been eliminated from campus entirely with the introduction of natural gas to the steam plant in fiscal 2015.



**Figure 5:** Total campus energy consumption by utility type since 2000

## Water Consumption

Figure 6 displays total potable water consumption since 2005. Water consumption increased in fiscal 2017. This may be the result of construction on campus and increased establishment watering for fields and plantings.



**Figure 6:** Total campus water consumption since 2005

## Looking Forward

In fiscal 2018, the Sustainability Office will focus on a number of key initiatives including completing the Sustainability Action Plan, an update to the College's STARS certification, new EcoRep initiatives, increased collaboration with academic programs, and further progress on the College's energy management goals.

In an effort to further Colby's commitment to a sustainable landscape, the Sustainability Office will collaborate with the grounds department and other campus constituents to pursue the Tree Campus USA designation. Tree Campus USA is a program supported by the Arbor Day Foundation that "helps colleges and universities around the country establish and sustain healthy community forests." Trees are an important part of the campus aesthetic and make the outdoor environment more inviting; additionally they sequester carbon and can provide energy benefits for individual buildings.

The Sustainability Action Plan is an update to the College's Climate Action Plan (CAP) published in 2010. The primary goal of the CAP was to achieve carbon neutrality. The goal of the Sustainability Action Plan is to set short- and long-term goals beyond greenhouse gases and include objectives for an academic focus on sustainability, administrative policies, environmental stewardship in landscape and stormwater management, and operational practices like cleaning and waste reduction.

In 2013, Colby received a Gold STARS rating from the Association for the Advancement of Sustainability in Higher Education (AASHE). Since that time, the College has created and expanded upon a number of sustainability programs, which should further improve the College's score. The Sustainability Office will continue work this fiscal year to update the College's certification materials and apply for recertification in December.

Efforts continue to further integrate sustainability into facilities operations and into the College's academic mission through visible sustainability projects and using College facilities and grounds as a living laboratory. Managing the grounds as a natural Maine landscape, along with installation of rain gardens and bioswales on campus, will further support biodiversity and reduce the College's burden on the local sewer system and streams.

For the latest green news at Colby, visit [www.colby.edu/green](http://www.colby.edu/green).