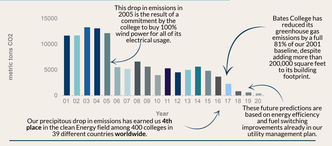
Bates College Carbon Report

The Data

Greenhouse Gas Emissions: History, Trends, & Predictions

Bates Campus Greenhouse Gas Emissions



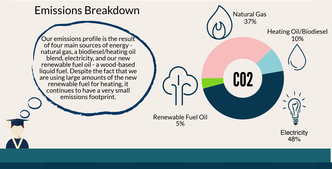
This drop in emissions in 2005 is the result of a commitment by the college to buy 100% wind power for all of its electrical usage.

Bates College has reduced its greenhouse gas emissions by a full 81% of our 2001 baseline, despite adding more than 200,000 square feet to its building footprint.

These future predictions are based on energy efficiency and fuel switching improvements already in our utility management plan.

Our precipitous drop in emissions has earned us **4th place** in the clean Energy field among 400 colleges in 39 different countries **worldwide**.

Emissions Breakdown



Our emissions profile is the result of four main sources of energy - natural gas, a biodiesel/heating oil blend, electricity, and our new renewable fuel oil - a wood-based liquid fuel. Despite the fact that we are using large amounts of the new renewable fuel for heating, it continues to have a very small emissions footprint.

The Plan

Where We're Going, and How to Get There

Fuel switching, lighting and heating efficiencies, and renewable electricity production will allow Bates to drastically reduce its emissions over the next five years. By implementing the following measures, we will be able to achieve our goal of carbon neutrality by 2020.

2016

Variable Frequency Drive Motors

These are highly efficient motors which aren't just on or off - they deliver a spectrum of power in order to match the demand.

2017

HVAC Controls

HVAC stands for Heating, Ventilation, and Air Conditioning, and represents the bulk of our emissions footprint. The ability to have granular control over HVAC is a huge efficiency gain.

2018

LED Lighting Upgrades

LEDs are quite simply the best lighting technology around. They have a 25 year life, no mercury, and operate for one-tenth the electricity of an incandescent.

Switching Central Heating Plant to Renewable Fuel

Made from tree offcuts, this liquid biomass-based fuel has a carbon emissions footprint 85% less than heating oil.

Insulation

Tightening up and insulating the building envelope helps to decrease both heating and cooling loads.

2019

Biodiesel as Fuel Oil Substitute

We can substitute biodiesel for heating oil, drastically reducing our emissions in many of our smaller houses.

Solar Array

Solar panels are a fantastic technology that just sit there and do their thing for 45+ years. They often outlast the roof they are placed on. No moving parts, minuscule maintenance, and ultra dependable.

2020

By implementing these measures, Bates will be able to achieve its carbon neutrality goal by 2020.

Our New Fuel

Renewable Fuel Oil: What is it, How is it Made, and How Does it Help?

Renewable Fuel Oil

Renewable Fuel Oil is a biomass-based, sustainable fuel that is made from wood waste products. Because it is a liquid, it is much easier to retrofit into existing heating systems.

1 The starting product is wood off-cuts and sawdust from sustainably harvested timber.

2 The wood is heated to a high temperature in the absence of oxygen. Instead of burning, volatile compounds which contain energy are given off from the wood.

3 The volatile compounds are cooled and condensed in to a liquid form.

4 The wood-based, liquid fuel is collected, transported to Bates, and used to run our central heating plant, which heats our main campus.

Because the feedstock for this fuel is sustainably-harvested wood, its lifetime greenhouse gas emissions profile is extremely low.

The Money

Growth within Economic and Environmental Sustainability

The big question is, how are we going to pay for all this stuff? It's not enough to have good intentions. There are several ways to go about paying for energy efficiency and renewable energy production projects. Here are a few -

Utility Annual Savings vs. Cumulative Annual Savings

Bates pays about $1 million each year in utility bills, down from about $4 million a few years ago. Each insulation or LED lighting project decreases our overall operating costs. The cost of the project divided by the amount it will save us annually will give the simple payback. If a project pays for itself in 3 years, then it is a good candidate; if it pays for itself in 35 years, not so much.

Our energy efficiency initiatives are reaping rewards, saving us a little over a million dollars annually in avoided utility spending. A portion of this money goes towards future energy efficiency projects - on the docket for the coming years - continued LED lighting conversions, as well as ventilation upgrades.

Green Innovations Grants

Our utilities savings are also being allocated to a initiative called our Green Innovations Grants. These competitive grant opportunities are meant to crowd-source good sustainability ideas from the Bates community. If students, staff, or faculty have an initiative that they'd like to see happen, they submit a grant proposal to the Committee for Environmental Responsibility (CER). The CER awards the most impactful proposals with funding and technical support. The goal is meant to empower the Bates community to be thinking and acting on sustainability initiatives on the campus.

Solar Power Purchase Agreements (SPPAs)

A Solar Power Purchase Agreement is similar to a lease for solar panels. It works like this: a company or individual buys, owns, and maintains a solar array on your roof. You buy power from them the way you would from a utility. After six years, the system's cost is paid for by a combination of tax incentives and your utility bills. At this time, you can buy the array for a drastically reduced price, and become your own power provider. These work especially well for nonprofits, which can't take the large tax incentives, but which, in addition, can be a way for organizations to essentially "borrow" overnight, without having to spend more that they're already paying on their utility bills.

How to Get Involved

Bates is on the cusp of emerging as a leader in the sustainability realm - but it will take a collective effort. Here's how to help pitch in.

Green Innovations Grants

If you have a good sustainability idea, we would like to give you money to make your idea happen. Bates awards grants up to $2,000 to students, staff, or faculty for sustainability projects around campus.

Committee for Environmental Responsibility

This faculty, staff, and student group work to craft high-level sustainability policy and help provide direction for the college.

Student Clubs

Here are just a few of the clubs that are actively involved in sustainability:

Ecolleges
Environmental Coalition
Outing Club
NEWS
Food Action Committee
Garden Club
Bates Gleaners

Help Create a Sustainability GEC

A core group of professors are exploring the idea of creating a Sustainability General Education Credit (GEC). Let your teachers know if you are interested in giving feedback.

Be a Kinder, More Engaged Person

Use your Commons Mug. Don't leave the windows open or the lights on. Sort your recycling. Use a (Green) bike. Studies show that roughly 65% of greenhouse gas emissions can be altered with simple behavior changes. Please don't think that you can't or aren't already making a positive difference!

Please contact us if you have questions or would like to help us in our efforts. Our goal is to pave the way towards sustainability with real-world, practical solutions. Check out the Bates Sustainability website or email Tom Twist at ttwist@bates.edu