

RUSA

RUTGERS UNIVERSITY
STUDENT ASSEMBLY

Rutgers University Sustainability Task Force Report

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RUSA Sustainability Ad-Hoc Committee

After the Spring elections of 2016, the Rutgers University Student Assembly (RUSA) voted to create the first Ad hoc Sustainability Committee within the assembly. Prior to April 2016, RUSA considered sustainability initiatives to be under the purview of the University Affairs Committee, which already deals with matters concerning transportation, public safety, and dining. While the University Affairs Committee made previous efforts to work on sustainability initiatives, these efforts were sporadic and isolated, only passing three pieces of legislation concerning sustainability in the 2015-2016 academic year. Moreover, after meticulous research and study of both the content and structure of the other thirteen Big Ten Student Governing bodies, it was found that nine of these universities already had a standing Sustainability Committee in existence that worked primarily on initiatives that required action from either the respective Student Governing Association, the student body, the administration, or a collective of all three.

The purpose of this committee was to raise awareness on environmental issues within the Rutgers student body and the New Brunswick community, promote sustainable living habits, and undertake initiatives to mitigate both the individual and collective impact on our immediate environment. However, the crux of this task force laid in researching innovative economic solutions for the conservation of energy through the University, as well as individual cost-saving incentives for students in order to increase awareness, commitment, and participation. The evident necessity for a student oriented sustainability committee became even more apparent when the department of the Rutgers University Facilities and Capital Planning established a Sustainability Committee to conduct research and large-scale initiatives such as the implementation of solar panels as well as ensuring infrastructure standards were compatible with LEED building requirements. Although the undertaking of these initiatives proved to be extremely significant in the overall reduction of the university's carbon footprint, there were still a multitude of visible environmental issues. Thus, the assembly felt that these could be better addressed by a single committee devoted to changing the off-campus culture, addressing the lack of awareness both within the student body as well as the New Brunswick community, and resolving the absence of a collaborative structure comprised of students, faculty, and administration centralized on the coalition of environmental stewardship and education.

We encourage all individuals striving to enact environmental change at Rutgers University to focus on the big issues facing us as a university. Climate change and environmental negligence are real issues that affect all stakeholders at Rutgers University and society at large. Instead of simply talking about revolutionary ideas, we must set the example for others through action. The university must accept greater responsibility by publishing a climate action plan and establishing an administrative Office of Sustainability. These actions, along with others later outlined in this report, will solidify Rutgers role as a leader in sustainability not only in the Big Ten conference, but nationwide.

Summary of Task Force Actions during the Fall 2016 Semester

Zero Waste Events

In an effort to uphold the Sustainability Task Force's original mission statement of encouraging, promoting and practicing sustainable habits, our task force wrote and passed legislation to hold the Rutgers University Student Assembly accountable for programming events that will yield zero waste. In order to attain this goal, clearly distinguished recycling bins as well as trash bins were mandated to be in place at each event sponsored and co-sponsored by RUSA. In the future we would like to see compost bins present at these events as well.

Foam Free Events

To further ensure the tangibility of holding zero waste programming events sponsored and co-sponsored by RUSA, the Sustainability Task Force wrote legislation to guarantee that no styrofoam products would ever be used at a RUSA sponsored event again. This initiative was originally inspired by the proactive commitment of The Ohio State University to make their campus "Foam Free", in that no on-campus mercantile establishment will provide styrofoam containers for any purpose. Though the Task Force initially began the implementation of more sustainable practices through the elimination of products in the undergraduate Assembly in order to monitor its practicality and applicability, the Sustainability Task Force would like to further implement this initiative by rewriting specific provisions in the RUSA Allocations Standing Rules to make this enforceable to all undergraduate clubs and organizations that are funded through Allocations. Lastly, the Sustainability Task Force will work on unifying the materials of the take-out containers between campuses, as styrofoam take-out containers are still distributed on College Avenue, Livingston and Busch Campuses.

Campus Composting

As the Sustainability Task Force continuously researched the structures and organization of the Sustainability Committees at other undergraduate institutions, primarily in the Big Ten, the concept of composting was repeatedly brought up as a complex yet extremely rewarding initiative that we felt could be implemented at Rutgers University New Brunswick. Members of our Task Force have been reaching out to members of other Sustainability Committee's in their respective undergraduate student associations with a unified and comprehensive list of questions to ascertain the process of implementation, the feasibility of either industrial (large-scale) or campus-wide (small-scale) composting. Ultimately the Sustainability Task Force would like to work on the implementation of the socialization and normalization of composting in highly trafficked areas, as well as ensuring that all dining halls will compost any excess organic materials that are not sent to the local livestock farm for feeding.

Summary of Task Force Actions during the Spring 2017 Semester

Rutgers Environmental Coalition

The RUSA Sustainability Task Force played a role in the formation of a coalition of various environmentally focused student organizations. This coalition will allow the leaders of environmental organizations to network and cooperate with one another, while also facilitating discussion on sustainability and environmental issues at Rutgers. The coalition will allow students to collaborate on projects with a large group of committed students and will provide them with a foundation for promoting initiatives and raising awareness as well as an outlet to share ideas, facilitate discussion, and get feedback. The Rutgers Student Environmental Coalition (RSEC) aims to unite students and give them a louder voice for sustainability at Rutgers.

Dining Hall Sustainability

The Sustainability Task Force has worked with University Dining Services and the Dining Hall Advisory Committee to improve sustainability in the dining halls. Dining Services and RUSA worked to together to implement the Cupanion reusable water bottle in takeout. The bottles, which were provided to all students with a meal plan, will help to reduce paper and plastic waste accumulated in the dining halls. The Sustainability Task force has advocated for the elimination of Styrofoam, which poses a significant environmental threat, as well as implementation of a composting program in the dining facilities. Additionally members of our Task Force served on the Dining Hall Advisory Committee and advocated for the implementation of more sustainable dining options. In April of 2016, Neilson Dining Hall implemented healthier and more sustainable takeout options that replaced previous items. Rutgers Dining Services will be participating in a movement called Menus of Change, which is led by Stanford University and the Culinary Institute of America. Other initiatives include, but are not limited to, reducing food waste, raising awareness, and increasing recycling efforts in the dining facilities.

Climate Change and Rutgers University

Since the beginning of the industrial revolution, around 1750, the Earth's global temperature has been steadily rising. Although some changes in planetary climate are natural, there is a consensus among environmental scientists that climate change is real and caused by human activity. Human activities have released large amounts of carbon dioxide and other greenhouse gases into the atmosphere. The majority of greenhouse gases come from burning fossil fuels to produce energy, but other activities such as deforestation, industrial processes, and agricultural practices also emit greenhouse gasses into the atmosphere¹. As a result, there has been an increased emphasis on the reduction of these harmful fumes. The prevalence of greenhouse gasses and a reliance on petroleum based products are already having a considerable impact on the planet. Earth's average temperature has risen by 1.5°F over the past century, and is projected to rise another 0.5 to 8.6°F over the next hundred years². Agriculture, infrastructure, and weather will all be impacted by these changes. Longer growing seasons, milder winters, more frequent flooding, heavier rains, and hotter summers are all consequences resulting from climate change

Rutgers University, the State University of New Jersey, is located in the Northeast where climate change has had a substantial impact. Rising temperatures increase heat stress, heat related deaths, and decrease air quality. This can put students, faculty, and staff with preexisting health conditions like asthma at a greater risk for health problems. The frequency, intensity, and length of heat waves are also expected to increase. Between 1958 and 2012, the Northeast saw more than a 70% increase in the amount of rainfall during heavy precipitation events,³ more than any other region in the United States. This can lead to drought conditions in summer as warmer temperatures increase evaporation and accelerate snowmelt. Warmer and wetter conditions create suitable habitat for ticks and mosquitoes, exposing humans to more vector-borne diseases like Lyme disease and West Nile Virus⁴. By working to mitigate climate change, the impacts of these consequences will be significantly diminished. Rutgers University will play a vital role in ensuring the safety and security of the student body and the entire Rutgers community.

¹ <https://www.epa.gov/ghgemissions/global-greenhouse-gas-emissions-data>

² <https://www.epa.gov/climatechange/climate-change-basic-information>

³ <https://www.epa.gov/climate-impacts/climate-impacts-northeast>

⁴ <https://www.epa.gov/insect-repellents/risk-disease-mosquito-and-tick-bites>

Sustainability and Rutgers University

In 2005, Rutgers University created the Committee for Sustainability, which is comprised of faculty, staff, and students to engage the university community and advise senior administration on sustainability issues. The committee is responsible for⁵:

1. Recommending appropriate policies for sustainability
2. Assisting with identifying suitable projects for sustainable initiatives
3. Assisting with completing sustainability audits of the University
4. Recommending appropriate goals;
5. Assisting with preparing annual reports on achievements.

The last report by the Committee for Sustainability was published in 2007.

In addition to having a standing sustainability committee, Rutgers also hosts an Annual Sustainability Symposium, which is an annual conference comprising of presentations and roundtable discussions between students, faculty, and guests.⁶ The symposium typically takes place during Earth Week and is intended to create a dialogue for sustainability at Rutgers University. To establish the university's commitment to sustainability, Rutgers University Facilities and Capital Planning published a 34 page Sustainability Plan in 2009.⁷ This plan discussed many important initiatives, but the current status of these initiatives remains unclear as there has not been a follow up plan or an update. The Rutgers School of Environmental and Biological Sciences offers a minor in Sustainability. The program is directed by George Clark from the Department of Human Ecology.

⁵http://masterplan.rutgers.edu/sites/masterplan/files/Rutgers%202030%20-%20Volume%201%20-%20Rutgers%20University%20-%20New%20Brunswick_r3.pdf (117)

⁶ <http://www.rei.rutgers.edu/news-and-announcements-list/521-ru-sustainable-symposium>

⁷ https://facilities.rutgers.edu/content/media-files/July_09_-_Rutgers_FINAL_Sustainability_Plan.pdf

Waste Management

The university's partnership with Waste Management has resulted in significant improvements. Since the implementation of single-stream recycling, 67% of material has been diverted from landfills. The university has set clear and feasible goals, but can still improve.

Since the early 2000's, Rutgers has incrementally increased the recycling rate. At present RU recycles around 70% of all solid waste, which falls well short of the goal set forth by the University in 2013 of an 85% recycling rate by 2015.⁸

Currently Rutgers University separates waste into two categories: trash and recyclables. All recycling on campus is single stream, which includes plastic bottles and containers #1-7, glass bottles and jars, aluminum, steel, tin, paper, food and beverage cartons, and cardboard. Rutgers University has established its commitment to recycling, and the university solidified its role as leader in recycling among higher education institutions after winning the Gorilla category of the intercollegiate RecycleMania tournament for the ninth consecutive year, with over 2 million pounds of recycled material.⁹

Although Rutgers is a leader in sustainably disposing of recyclable materials, the university has failed to address the unsustainability of food waste management on campus. The food waste management techniques currently used by dining facilities on campus have been in place since the 1960s and raise questions on whether it is the most sustainable method. Rutgers dining facilities have been diverting food waste to Pinter's Farm, a farm about 15 miles away from campus, where it is used as feed for hogs and cattle. After students finish their meal, they put their plates onto a conveyor belt where food scraps are separated. Certain foods, such as coffee grounds and scraps with high concentrations of salt, are separated from the food because they can be harmful to livestock. Workers then take the food scraps and put them through pulpers, where the waste is dehydrated and pulverized, which reduces the volume by up to 80 percent. Food scraps are stored in covered containers and refrigerated, or stored in a cool place until the vendor from Pinter's Farm picks them up. Rutgers University diverts on average 1.125 tons of food scraps every day to Pinter's Farm at a rate of \$30 per ton.¹⁰ This procedure costs the university thousands in expenses arising not only from disposal, but also from maintenance, operation, and transportation.

⁸[https://www.wm.com/documents/pdfs-for-services-section/Case-studies-municipal/001807_Rutgers_CaseStudy_LR%20\(2\).pdf](https://www.wm.com/documents/pdfs-for-services-section/Case-studies-municipal/001807_Rutgers_CaseStudy_LR%20(2).pdf)

⁹ <http://recyclemaniacs.org/2016results>

¹⁰ <https://www.epa.gov/sites/production/files/2015-08/documents/rutgers.pdf>

There is a clear issue with student engagement and understanding of recycling, since students are frequently unsure of where waste belongs and whether or not it is recyclable. Out of frustration or apathy, many simply dispose of recyclables in the trash. Many waste receptacles don't clearly label which materials belong in the trash or recycling. One way to combat this lack of awareness is by educating incoming students during orientation on the details of our waste management and recycling program, thereby raising the level of commitment and participation within the next generation of students and leaders. In general, additional research should be conducted to better understand the level of student awareness and the subsequent cultural norms and tendencies they follow. Preliminary and post surveys as well as data analytics are an effective way to assess the understanding of the current policies in place as well as their effectiveness. Programs such as town halls that are designed to facilitate and engage the student body in topics that affect not only them but their student experience, should be programmed and organized with annual frequency so that the collection of data and testimonies may be gathered, analyzed and eventually utilized to ascertain what improvements can be further made.

Currently Rutgers dining facilities use Styrofoam containers for takeout on three out of four campuses (Livingston, Busch, and College Avenue). Neilson Dining Hall on Cook Campus is the only dining hall that has moved away from the use of polystyrene containers, having replaced them with plastics containers instead. Polystyrene is non biodegradable, meaning it is not broken down naturally, and since polystyrene is made from petroleum products, a continued use of Styrofoam products only reinforces a reliance on nonrenewable resources. Rutgers University currently runs on a single stream recycling system, but Styrofoam is not recyclable through this system. As a result, Styrofoam containers are either deposited in landfills or inadvertently sent to a recycling center, where they will be sorted out and eventually thrown in the trash.

Energy and Water Consumption

Rutgers University requires a large amount of energy and water to keep all four campuses operating. Normally such a large consumption of energy and water would be wasteful and detrimental to the environment; however, Rutgers University takes a few steps to becoming more sustainable in its energy and water use. The University uses over 950 million gallons of water per year. Utilities maintains over 60 miles of underground water and sewer distribution on our main campuses, monitoring water use to ensure it is in sound condition.¹¹ The pipes have also been replaced to carry heated water more efficiently.

Since 1995, Rutgers has utilized a cogeneration plant to produce electricity and heating for the Busch and Livingston campuses. The plant produces roughly 300,000 Kwh daily accounting for about 90% of the energy demands of the two campuses. At 75% efficiency, the plant exceeds the normal efficiency of typical power plants, which is about 35% efficiency. The energy plant has reduced CO2 emissions by 70,000 tons and saved \$27,587,668. For some of the other buildings, Rutgers utilizes Geothermal energy for heating and cooling of the new Rutgers School of Business-New Brunswick building on the Livingston Campus. The geothermal energy project that was successfully completed in 2013 uses the Earth's core to extract energy to offset energy costs. The project consists of 321 wells at a depth of 500 feet to provide 700 tons of cooling annually.¹² In 2013, Rutgers added additional solar panels on Livingston Campus that add about 8 megawatts of solar power by way of solar canopies over 28 acres of parking to the existing 1.4 megawatt solar farm built in 2009. The combined solar energy capacity can produce 63% of the electrical demand of the campus which then lessens the power used by the cogeneration plant.¹³

¹¹ <http://facilities.rutgers.edu/facilities-units/utilities-operations/water-and-sewer>

¹² <http://climatechange.rutgers.edu/rutgers-climate-stewardship#energy-use-and-generation>
(cogeneration)

¹³ <http://climatechange.rutgers.edu/rutgers-climate-stewardship#energy-use-and-generation> (solar power)

With the help of New Jersey's Clean Energy rebate program, Rutgers replaced existing motors in air handlers, cooling towers, exhaust fans, and circulating pumps with EPA high efficiency motors and installed variable-frequency drives. With these changes, the University has been able to save 2.8 million KWH of electricity. Rutgers has also been able to benefit from PSE&G's Direct Install Program, which replaced old light fixtures with higher efficiency bulbs and motion sensors. The estimated energy savings for the first phase are 7 million Kwh per year, but those numbers could rise as high as 42 million Kwh of electricity per year. All new buildings and major renovations at Rutgers University are required to be built to LEED Silver Standards .

Rutgers University uses over 580,000,000 kWh of electricity per year¹⁴ and uses over 40.5 million therms of natural gas per year as an energy source to heat buildings and to generate electricity at two cogeneration plants. Heating oil is used in buildings where natural gas is unavailable. Additionally, the EPA reported that from 2009-2014, University Facilities and Capital Planning at Rutgers reduced their operating costs by \$41 million and prevented 261,080 metric tons of CO2 emissions through environmental initiatives.¹⁵

Greenhouse Gas Emissions and Carbon Footprint

In 2012, Rutgers University updated a report on New Jersey's total estimated greenhouse gas emissions that were reported in New Jersey's Statewide Greenhouse Gas Emissions Inventory. The inventory was based on fuel use data received from the Energy Information Administration. In 2012, the total estimated greenhouse gas emissions for New Jersey was 111.7 million metric tons of carbon dioxide equivalent (MMTCO₂e). 46.3% of that number is derived from transportation, 20.9% electricity generation, 12.1% residential, 10.3% industrial, 10.1% commercial, 7.2% highly warming gases, 4.7% waste management, and .8% land clearing.¹⁶ The University has not continued its research since the last report.

¹⁴ <http://facilities.rutgers.edu/facilities-units/utilities-operations/electric>

¹⁵ http://masterplan.rutgers.edu/sites/masterplan/files/Rutgers%202030%20-%20Volume%201%20-%20Rutgers%20University%20-%20New%20Brunswick_r3.pdf (111)

¹⁶ <http://climatechange.rutgers.edu/docman-list/special-reports/354-2012-update-to-new-jersey-s-statewide-greenhouse-gas-emission-inventory/file>

A Memorandum of Understanding was signed by Rutgers University on November 3, 2009 with the United States Environmental Protection Agency pledging to reduce the university's carbon footprint and improve the environment.. Between November 2009 and June 20, 2016 Rutgers-New Brunswick/Piscataway has managed to reduce its carbon footprint by an estimated 444,509 Metric Tons of Carbon Dioxide Equivalent (MTCO₂e) and save an estimated \$69,571,964 in operating expenses. Rutgers University is currently a member of the United States Green Building Council, the Association for the Advancement of Sustainability in Higher Education, the New Jersey Higher Education Partnership for Sustainability, as well an Energy Star and Combined Heat and Power Partner with the EPA.

Rutgers University has made the following reductions since November 2009 (metric tons)¹⁷

- Energy Conservation: 149,141
- Alternative Energy: 242,547
- Water Conservation: 3,900
- Solid Waste: 46,388
- Green Landscaping: 380
- Transportation : 2,153
- Total: 444,509

¹⁷ <http://climatechange.rutgers.edu/rutgers-climate-stewardship#energy-use-and-generation> (Tracking Environmental Stewardship in Partnership with the U.S. Environmental Protection Agency)

Institutions

Rutgers Climate Institute

The primary purpose of the Rutgers Climate Institute is to address the concerns of climate change through a university-wide effort. Through research, education, and outreach, the Climate Institute collaborates with other departments and analyzes climate change in natural, social and policy sciences. Additionally, the Climate Institute educates the Rutgers community and the public on climate change and potential methods to mitigate its effects. The institute examines the social, economic, political, cultural, and behavioral factors behind climate change and recommends policies that combat climate change both on-campus and off-campus. The Climate institute is comprised of both professors and faculty, and also offers research opportunities and internships to students. In addition to educating the public on the social, political, and environmental impacts of climate change, the Climate Institute offers scholarships and grants to qualified students.¹⁸

Rutgers Energy Institute

The primary purpose of the Rutgers Energy Institute (REI) is to examine energy sources and determine efficient and sustainable alternatives. The Energy Institute revolves around research, outreach, education, and policy regarding energy use and consumption. Similar to the Rutgers Climate Institute, the Rutgers Energy Institute also offers research and internship opportunities through the REI summer internship in addition to grants and scholarships. The Rutgers Energy Institute is comprised of both faculty and students, and also holds symposiums on sustainable energy and resource allocation. In regards to education, the Rutgers Energy Institute has also developed seminars to educate students and the public about the societal, political, economic, and environmental consequences of energy usage.¹⁹

The Rutgers Energy Institute has four primary areas of focus:

1. Education of undergraduate and graduate students;
2. Pioneering research;
3. Outreach to the community to share information and engage the public
4. Policy advice to government, business, and civic leaders who require current knowledge about energy use, alternatives, and innovations to guide decision-making and public planning.

¹⁸ <http://climatechange.rutgers.edu/about-us>

¹⁹ <http://rei.rutgers.edu/>

Rutgers Eco-Complex

The Rutgers EcoComplex, currently directed by Serpil Guran, is a two story 32,000 square foot state-of-the-art business incubator complex with wet and dry labs, tech scale-up space and office space with an additional 46,000 square feet of greenhouse space. A 120-seat auditorium, one 40-seat classroom, one 18-seat classroom, and large conference room are also available for presentations and educational programs. The EcoComplex is able to harvest energy and power the facility through utilization of landfill gas from a nearby landfill.

The EcoComplex serves as a center for clean energy assessments, environmental research, and business incubation programs in bioenergy, bioreactor landfills, anaerobic digestion of food waste, cogeneration, landfill gas to transportation fuel, compost pile management, sustainable greenhouse production, and aquaponics. The facility assists private for-profit businesses by providing energy consultation services, demonstrating renewable energy pilot programs, and testing potential initiatives in agriculture and waste management. The complex can create pilot scale demonstration project that can predict the economic feasibility and environmental impact of new technologies.²⁰

The EcoComplex is supported by the Rutgers University School of Environmental and Biological Sciences (SEBS) and the New Jersey Agricultural Experimentation Station (NJAES). The Rutgers EcoComplex's stated mission is to "promote economic development in the environmental and alternative energy innovation arenas, including testing and verifying new alternative energy innovations, the remediation and protection of environmental quality, and the compatible sectors of food and innovative agriculture".²¹

Rutgers Student Farm

The Student Farm is five acre community run farm that was established in 1993 to give students the opportunity to gain experience growing organic produce and managing a farm facility. The farm is located at Rutgers' Horticultural Research Station on the G. H. Cook campus of Rutgers University. The farm offers summer internships to students through School of Environmental and Biological Sciences (SEBS) and The Office of Agriculture and Urban Programs (OAUP). The internship teaches students about small-scale organic farming and the planting and harvest of various vegetables and produce. The Farm is run entirely by students under the guidance of a faculty adviser. The Student farm supports the community by providing SEBS students with vital experience in managing a sustainable agricultural program, providing shareholders with organic produce, and donating shares of produce to local community service organizations like Elijah's Promise.²²

²⁰ http://ecocomplex.rutgers.edu/research_facilities.php

²¹ http://ecocomplex.rutgers.edu/about_us_mission.php

²² <http://agriurban.rutgers.edu/StudentSustainableFarm.html>

Dining Halls

Rutgers University Dining Services has recently taken note of the commonly used materials that are unable to be recycled such as plastic bags and paper cups, and have attempted to phase these items out with initiatives that provide students with various reusable products such as canvas bags, stainless steel cups, and plastic takeout containers. Starting in 2012, Dining Services began the distribution and promotion of reusable takeout bags in order to reduce the amount of plastic bags given out in the 2011-2012 school year, which was estimated to be about 1.5 million²³. This past winter in the beginning of 2017, Dining Services also eliminated the use of all paper and plastic products used for consumption of liquids, phasing out paper cups, plastic straws and lids, while replacing them with reusable stainless steel cups.

In consistency to the elimination and reduction of wasteful materials, Dining Services also sought to reduce the amount of food waste produced by eliminating cafeteria trays in Rutgers-New Brunswick and Piscataway dining halls, which consequently allowed Dining Services to save on the cost of food, water, and the sanitizer used to wash dishes. As a result, there has been a 20% reduction in the amount of food waste created by students and savings of \$30,000 per week in food costs.²⁴

By working with Pinter Farms to collect more than a ton of discarded food a day from the dining halls, this food waste is able to be condensed and made into pig and cattle feed through a food pulping system. Busch Dining Hall, Henry's Diner, and Kilmer's Market use an aerobic digester to liquify food down the drain rather than adding discarded food to landfills. The dining hall also use a Vegewatt machine to convert used frying oil into electricity and heating water. The University has also saved \$30,000 a week in food costs and there has been a 20% reduction in food waste by discontinuing the use of cafeteria trays in dining halls. The produce used by the Rutgers Dining Services are locally sourced with 100% of all produce and dairy products²⁵.

²³ <http://climatechange.rutgers.edu/rutgers-climate-stewardship#dining-services-and-local-produce>

²⁴ <http://news.rutgers.edu/feature/cafeteria-trays-dropped-dining-halls-rutgers-reduce-waste/20141214#.WPahYojyu00>

²⁵ <http://climatechange.rutgers.edu/rutgers-climate-stewardship#dining-services-and-local-produce>

Transportation

The Rutgers Energy Institute has undertaken many initiatives including a Solar-to-Vehicle Project aimed to promote the use of electric cars by providing four ChargePoint America recharging systems for electric cars. The prototype recharging network for electric cars is powered by the Busch cogeneration plant and Livingston solar arrays. The 32 acre solar parking canopy on Livingston Campus generates 8 Megawatts of energy. There are multiple recharging systems for electric cars at Rutgers: two at the Center for Advanced Infrastructure and Transportation on Busch Campus, four charging stations on the Livingston campus, one behind Martin Hall on Cook Campus and one at the Rutgers EcoComplex.²⁶

Rutgers University has the second largest bus system in New Jersey, behind only NJ Transit, and has the largest campus bus system in the country. Since 2011, Rutgers has used alternative fuel vehicles by utilizing cleaned landfill gases and biodiesel fuel for buses.²⁷ The Department of Transportation have made it their mission to transport students across campuses easily and safely. Parking facilities are also available with the ownership of parking permits in parking decks, access-controlled lots, and restricted assigned lots. Rutgers University New Brunswick Campus offers a variety of transportation services. These services include bicycling, campus buses, and NJ Transit. Of these available transportation services, campus buses and the NJ Transit are open to students, faculty, and other members of the community. Campus shuttles are offered to transport students between different campuses. Each campus has its own respective bus route. All routes are accessible from Monday-Friday until the Weekend routes take over from Saturday-Sunday. In efforts ensure students safety at night, Rutgers University Department of Transportation Services (RUDOTS) offers a night shuttle called “The Knight Mover” available from Monday-Thursday between 3 A.M. to 6:45 A.M.²⁸

In efforts for providing more sustainable transportation, the Rutgers University New Brunswick campus has created a “Bike RU” program. Students can rent bicycles for \$25 per semester or summer or have the option of renting monthly for \$10. Students are required to return the bicycle in the exact condition it was acquired in.²⁹

²⁶ <http://www.rci.rutgers.edu/~dbirnie/Solar2Vehicle/>

²⁷ <http://climatechange.rutgers.edu/rutgers-climate-stewardship#transportation>

²⁸ <http://rudots.rutgers.edu/campusbuses.shtml>

²⁹ <http://bikes.rutgers.edu/>

Education and Awareness

Rutgers University has a host of different initiatives and organizations aimed at providing awareness and spreading education of sustainability issues. Some of which include:

Recycle Banks
Recyclemania
Rutgers Center for Green Building
Rutgers Climate Institute
Rutgers Earth Week
Rutgers Energy Institute
Rutgers Student Environmental Coalition (RSEC)
Rutgers University Committee for Sustainability
SEA: Students for Environmental Awareness
Single Stream Recycling Bins
Sustainability Minor
Sustainability Task Force
The Center for Advanced Energy Systems

Beginning in 2016, Rutgers hosts an annual Sustainability Symposium called “RU Sustainable”. The purpose of which is to bring state of the art technology and research to the forefront of students minds. Guest speakers are brought into help spark crucial conversations and to discuss the future of sustainability. Rutgers also provides tips and suggestions on how to conserve energy for students and faculty alike. Resident Assistants are given instructions on how to appropriately prepare rooms for long term breaks, such as Winter and Spring Break. This includes turning off lights and unplugging all electronics during these extended periods of absence.³⁰

³⁰ <http://facilities.rutgers.edu/about-ufcp/sustainability/energy-conservation-tips>

To help increase student awareness and involvement many Universities have student programs that elect student leaders to help engage the community and spread information and tips regarding sustainability and the environment. These students are dedicated to creating a culture of sustainability at their respective campuses. Programs such as Eco-Reps or Eco-Hawks, a leadership collective comprised of students acting as representatives, focusing on raising awareness on immediate environmental issues and sustainable living habits and practices, have been implemented in the following Big Ten Schools:

The Ohio State University
Northwestern University
Pennsylvania State University
Michigan State University
University of Illinois - Urbana-Champaign
Purdue University
Indiana University - Bloomington
Nebraska University - Lincoln

Other Big Ten schools have taken the Eco-Rep program a step further by creative a Living Learning Community (LLC) focused on sustainability. These special housing programs allow students that are interested in sustainability to live with other students whom share a common interest in environmental stewardship. They are invited to work on projects outside of the classroom and learn about the field of sustainability with a hands on approach. The LLC provides these students with dedicated faculty mentors that may serve as collective advisors as well as the ability to register for exclusive classes tailored towards environmental sustainability. By instituting a program similar to Eco Reps or a Sustainability LLC, Rutgers could increase the level of participation and commitment towards environmental stewardship within the student body as well as education on environmentally conscious practices and publicity of progress at our university thereof.

Sustainability in the Big Ten Conference

Purdue University

Purdue University has several programs to involve students with campus sustainability, including Eco-Representatives that are elected by students in residence halls to promote recycling and saving electricity. They also have access to tours of the Wade Utility Plant, West Lafayette Wastewater Treatment Facility anaerobic digester, as well as local wind farms³¹. First hand experiences of touring facilities such as these dissolves the disconnect between production and consumption, instilling a value of personal responsibility within students. Additionally, students, faculty, and visitors have access to thirteen bike stations around campus as part of a Zagster Bike Share program launched in 2015 with an Alcoa Foundation grant to provide commuters with environmental alternatives³².

Purdue has been an active participant in Recyclemania since 2010 and has placed in the Gorilla Prize, Grand Champion, Waste Minimization, and Big Ten categories in the past³³. One particularly successful program is the Friday Night Lights initiative headed by the Student Sustainability Council to reduce waste and save money by having volunteers turn off lights in academic buildings that would otherwise be left on over the weekends. In 2016 alone, 38,000 lights were turned off through this initiative³⁴.

Purdue University also has a Project Move Out initiative similar to Rutgers University to collect clothes, electronics, food, and furniture from students living in residence halls to donate to community organizations in the Greater Lafayette Area. This initiative has been in effect since 2000 with the university diverting over 40,000 pounds of waste annually between 2013 and 2015. Purdue University's most successful year was in 2016 recording the redirection of over 71,000 pounds of waste from landfills³⁵.

The Office of Campus Master Planning & Sustainability introduced a Tailgate Recycling Team program in 2012 where 13,380 pounds of mixed recyclables were collected in the first year with an average diversion rate of 16.7% per game. Since then, there has been an increase have gathered 30,000 pounds of mixed recyclable materials with a 28% diversion rate in 2015³⁶.

³¹ http://www.purdue.edu/sustainability/initiatives/education_research/eco-reps.html

³² <https://www.purdue.edu/recwell/aboutUs/newsAlerts/bikeShare.php>

³³ <http://www.purdue.edu/sustainability/news/getinvolved/RecycleManiaGI/index.html>

³⁴ <http://www.purdue.edu/sustainability/news/getinvolved/fnl14/index.html>

³⁵ <http://www.purdue.edu/sustainability/news/greencampus/moveout/>

³⁶ <http://www.purdue.edu/sustainability/news/getinvolved/TailgateTeam/index.html>

In addition to recycling, Purdue University also has a Farmer's Market every Thursday in the summer consisting of fifteen local farmers, small business owners, and student organizations to sell local produce and handmade goods. Purdue University has a variety of initiatives and organizations dedicated to campus sustainability and environmental consciousness to better their community.

In April of 2010, Purdue University and the Office of Campus Master Planning & Sustainability released the Sustainability Strategic Plan³⁷ to establish the following commitments:

- Improve formal collaboration on sustainability issues across operational units and academic disciplines/departments
- Invest in and use resources available on campus
- Promote the living laboratory initiative
- Effectively communicate sustainability values and programs

The Sustainability Strategic Plan sets strategic goals and agendas to focus on eight major sustainability program areas: Site Considerations, Water Resources, Energy and Built Environment, Materials Management, Food Systems, Academics and Research, Endowment and Development, and Community Relationships.

University of Michigan

The University of Michigan (UM) has consistently ranked within the upper echelon of environmentally responsible schools in the nation. UM has been composting pre-consumer food waste since 1997, and then later expanded to post-consumer waste in 2012. The program started when UM received a grant from the Washtenaw County Department of Public Works to cover the costs to test the feasibility of adding pre-consumer food waste to the City's compost site. During the 8-month pilot, over 30 tons of food waste were collected, and the program was considered a success. In 2015, UM diverted more than 375 tons of food waste away from landfills and is on pace to send almost 440 tons to the compost site in 2016.³⁸ The university doesn't compost food waste on site, but rather it has a partnership with WeCare Organics, the private operator of the City of Ann Arbor's compost site. Sixteen residence halls and dining facilities on campus participate in the composting program.

³⁷<http://www.purdue.edu/sustainability/strategicplan/index.html>

³⁸ <http://plantops.umich.edu/grounds/recycle/composting.php>

The University also encourages composting and student involvement through zero waste events, which allow students to divert waste away from landfills by recycling and composting at various events on campus. UM has set the ambitious goal of reducing the amount of waste being sent to landfills by 40% by 2025. UM has also implemented the Reusable Takeout Container Program (RTCP), where students can rent a reusable takeout container for a fee, and then return the container to recover their fee.³⁹

In September, 2011 University of Michigan President Mary Sue Coleman, reinforced the University's commitment to sustainability with the creation of the Office of Campus Sustainability and the university's adoption of long term Sustainability Goals. The goals were identified through a Campus Sustainability Integrated Assessment process (CSIA). The CSIA was an intensive, two-year project led by the Graham Sustainability Institute (GSI) and the Office of Campus Sustainability (OCS) involving more than 500 students, faculty, and staff representing 101 organizational units and 27 academic programs.

The purpose of the IA was to identify long term sustainability goals that are large in scale, require extensive planning and preparation for successful implementation, but yield substantial results in conservation and preservation. The geographic boundary that the goals are measured against included the five Ann Arbor Campuses (South, Central, Medical, North, and East Medical) only and do not include any property owned or leased by the University of Michigan outside of that boundary. All of the goals are measured against an FY2006 baseline, and strive to be achieved by 2025⁴⁰.

The goals are as follows:

- Reduce greenhouse gas emissions by 25%
- Decrease the carbon intensity of passenger trips on UM transportation options by 30%
- Reduce waste tonnage diverted to disposal facilities by 40%
- Purchase 20% of UM food in accordance with UM Sustainable Food Purchasing Guidelines
- Protect Huron River water quality by minimizing runoff from impervious surfaces and reducing the volume of land management chemicals used on campus by 40%
- Invest in sustainability culture programs to educate our community, track behavior, and report on progress over time

³⁹ <http://sustainability.umich.edu/news/minimizing-waste-one-container-time>

⁴⁰ <http://graham.umich.edu/media/files/CampusIA-FinalReport.pdf>

University of Nebraska – Lincoln

The University of Nebraska - Lincoln (UNL) dates its overarching primary sustainability goal back to 2010. They outlined a five year plan (2011-2015) to reduce energy use on campus by 15%, but after analyzing the data they fell short, ending up with a net reduction of 12.9%. While they have not yet reached their goal, they have gone from a bronze to a silver rating in accordance with STARS (Sustainability Tracking, Assessment, and Rating System which is developed by the Association for the Advancement of Sustainability in Higher Education) from 2014 to 2016.⁴¹

Within the academic buildings, the focal points of energy reduction were narrowed down to adjusting the operating hours of A/C equipment, improving efficiency of fume hoods, replacing old lights fixtures with more efficient ones, and expanding their control systems to provide only as much heating, cooling, and ventilation as needed per room. To achieve these goals UNL utilized a Thermal Energy Storage facility. In addition, UNL uses a closed water loop to act as a thermal energy transfer medium so rooms that need to be cooler have the heat extracted from them and sent to rooms that need to be warmer. The incorporation of the innovative CRES (Centralized Renewable Energy System) provides year-long heating and cooling without the use of steam boilers and water chillers. Instead, CRES sustainably warms and cools buildings by exchanging heat from treated wastewater. The system resembles a geothermal system, but instead of using the ground as a heat sink, it utilizes wastewater.⁴²

In regards to recycling, the last reported percentage of total amount recycled in 2015 was deemed to be 51%, a reduction from the previous year. This decline in total amount of solid waste as well as its projected decline even further is accredited to budget cuts due to the elimination of custodial support and the full-time recycling coordinator⁴³. Thus, the university's department of Facilities, Maintenance, and Operations relies heavily upon students to take their own initiatives and be proactive in order to compensate for these cuts. Following this, student volunteer projects such as "Go Green for Big Red" came about. Recycling Enterprises partners with them on this project which has students volunteer on game days go around the stadium and in parking lots to pick up and sort recyclables.

⁴¹ <http://fmo.unl.edu/images/energy-management-plan.pdf>

⁴² <http://news.unl.edu/newsrooms/today/article/city-unl-partner-to-create-unique-renewable-energy-system-at-nic/>

⁴³ <http://recycling.unl.edu/>

Composting has recently become an initiative taken on by students. Nebraska Union food vendors can now place pre-consumer food waste into special bins to be transported by Waste Management and Recycling to Big Red Worms, a new composting operation in West Lincoln. Additional phases will feature promotion and education by UNL's student government, The Association of Students of the University of Nebraska (ASUN). The University plans to expand the program to include all compostable waste generated in the Nebraska Union. Along with the establishment of the composting program⁴⁴, UNL has also decided to eliminate polystyrene containers in food packaging. UNL will allow the use of existing inventories of Styrofoam items before the campus transitions to other options, primarily paper-based products. After January 1, 2017, no university funds will be allocated to purchase Styrofoam products for food service.⁴⁵

In 2005, UNL began its GFL ("Good. Fresh. Local.") Sustainable Food Project, a very popular local dining program within the student body as well as the entire UNL community. The program defines 'local' as food that comes from Nebraska farmers, producers, and manufacturers and works to: serve traditional menu items that promote the value of local food; educate students about sustainable agriculture and the positive impact it has on the environment, local economy, and communities; and provides a new distribution opportunity for local farmers and producers in the profession of university food service.

In 2015, Chancellor Harvey Perlman established the Chancellor's Sustainability Commission (CSC) to make recommendations on the implementation of sustainable practices and advise on different aspects of sustainability. The CSC works closely with the UNL Sustainability Office and is comprised of two students, one graduate student and one undergraduate student.⁴⁶

⁴⁴ <http://news.unl.edu/newsrooms/today/article/composting-program-kicks-off-in-the-nebraska-union/>

⁴⁵ <http://news.unl.edu/newsrooms/today/article/campus-to-go-styrofoam-free-in-2016/>

⁴⁶ <http://sustainability.unl.edu/chancellors-sustainability-commission>

Michigan State University

Michigan State University has pledged to decrease its Energy Use Intensity⁴⁷ (EUI) by 20 percent in 20 million square feet by 2020, and in 2014 MSU reduced EUI by 14 percent. In terms of campus power supply, MSU has 19 million of the campus' 20 million square feet served by the T.B. Simon Power Plant, which provides steam and electricity from multiple fuel sources. Since 2009-2010, the campus has decreased coal use by 65 percent, which has contributed to an 18 percent decrease in greenhouse gas emissions. However, their total energy usage increased from 2013 to 2014, which can be attributed to weather that brought about an excessively warm summer and a particularly cold winter. The standing goal is to replace these steam driven A/C's with electric chillers that are more efficient in the reduction of energy consumption.

In the area of waste management the current goal is a 70% waste diversion by the end of 2017. The Surplus Store and Recycling Center have a solid waste collection program as well as processing and disposal services that are highly effective. Gross revenue for the sale of reusable, recyclable and compostable material reached an all-time high, with the Surplus Store increasing gross sales to over \$3.3 million, equaling an 18 percent increase. The Surplus Store and Recycling Center returned \$2.7 million to university departments and administration for credit on materials sold and facility costs. Additionally MSU provides public recycling drop off centers which accounted for 40 percent (or four million pounds) of the total recycling processed through the Materials Recovery Facility (MRF). Waste sorts have shown that 30 percent to 40 percent of the remaining 12 million pounds of annual solid waste is compostable or is composed of a non-recyclable product that can be converted into compostable material. Furthermore, traditional kitchen waste is taken care of through the usage of an anaerobic digester which turns waste into energy by breakdown of organic materials, dining hall food and manure, into natural gases via tiny microbes. Microorganisms in organic waste mixture decompose the material and produce biogas and digestate. Biogas is burned on site and generates energy to offset campus electricity usage. Digestate used as fertilizer on campus farms. However, they still have not accounted for other organic materials, such as napkins, paper towels, and compostable food packagings. Currently, the dining facilities accumulates over 14,000 pounds of food waste every day and in addition to sending this waste through the largest university owned anaerobic digester in the nation, students have also developed a Clean Plates at State initiative. The program encourages students to only take as much as they will eat⁴⁸.

⁴⁷ <http://sustainability.msu.edu/report/2014/#/>

⁴⁸ <http://35.9.51.48/index.php/services/composting-digestion/>

Another student dining initiative at MSU is the Meals for Mealworms⁴⁹ campaign, a research oriented project that inquires about the ability of mealworms to eat and decompose polystyrene (styrofoam) into compost matter. The project is now actively being studied with the hope of university-wide implementation, pending successful results. As of now, the research conducted in their laboratories has shown that mealworms eat styrofoam with a degradation rate of 20%. For now, they have in vessel composters and compost fields across campus as well as an organic farm and greenhouse.

MSU has 18 water wells that supply water to its campus. They are currently in the works of creating a water center and water curriculum. The vision of the water center is for it to be a network that will create a venue for water-related issues to be presented. This networking tool will increase efficiency and will allow opportunity for even more research to be conducted while the water curriculum is aimed at the educating of students⁵⁰.

In an effort to reduce the usage of cars on campus they have included the availability of affordable bikes for rent and purchase, full-service bike repairs, bike lanes and campus-wide bus routes. This step towards reducing vehicle congestion and emissions has proven to be a success as the university is now dealing with overcrowding of bikes and associated spaces. Energy, waste reduction, water, transportation and engagement are five areas in which MSU has focused on and continues to focus on in order to guide their success in the direction of improving sustainability. Although MSU does not have an Office of Sustainability, the university has an operational department called MSU Sustainability within Infrastructure Planning and Facilities⁵¹.

⁴⁹ <http://www.recycle.msu.edu/>
⁵⁰

<http://bespartangreen.msu.edu/news.php?id=2017-01-05-student-study-fosters-wave-of-focus-on-filtered-water>

⁵¹ <http://us2.campaign-archive2.com/?u=712ada140469f7241da382683&id=641a841770>

Indiana University – Bloomington

Indiana University Bloomington (IUB) hosts a wide variety of initiatives and programs to push for a more sustainable campus and student body. The IUB Undergraduate Student Association (IUSA) provides any undergraduate student with the opportunity to be a representative on a campus committee, including the Student Sustainability Council. In collaboration with other environmentally conscious student organizations, representatives from IUSA and the Sustainability Council aim to raise student awareness on climate change and environmental issues on campus. Programs such as SustainIU Week⁵² consist of speakers, art exhibits, and talks that encourage students to adopt more sustainable behaviors and to better understand the seriousness of climate change. These initiatives are run by students and are intended to involve the campus community in sustainability.

On the administrative side, The Indiana Office of Sustainability was established in 2008 from the recommendations of the 2008 Campus Sustainability Report, which recommended an office that reports to the Provost and the Vice President for Capital Planning and Facilities. The office has established 20 sustainability goals⁵³ the university plans to achieve by 2020. The goals are broken down into 7 categories:

- Leadership
- Academic Programs
- Energy, Atmosphere, and built Environment
- Transportation
- Food
- Environmental Quality
- Funding

Some of IUB's 2020 goals include:

- 30% reduction in greenhouse gas emissions
- 40% reduction in campus potable water consumption
- 20% reduction in total energy use

IUB has earned a STARS ranking of Silver in the AASHE Stars Program.

⁵² <http://www.indiana.edu/~sustain/programs/search-by-program-name.php>

⁵³ <http://www.indiana.edu/~sustain/overview/sustainability.php>

University of Maryland

The University of Maryland (UMD) is the most comparable institution to Rutgers of all the Big Ten Schools. The university has emphasized sustainable waste management in its facilities by adopting a single stream recycling system and implementing an on-campus composting program that includes leaves, yard waste, pre- and post-consumer food waste, and food packaging. Additionally, recycling from UMD construction sites will generate about 300 to 800 tons of recyclable waste per year. Striving to eliminate any excess waste, The University of Maryland even hires new employees using the paperless eTerp system to reduce unnecessary paper usage, and has updated paper towel and toilet paper dispensers across campus to utilize recycled paper. The “Can The Can” program along with the “Please Don’t Litter” campaign have both encouraged student awareness and involvement on campus, while simultaneously reducing waste and improving sustainability through increased participation. UMD has increased the recycling rate of individuals of campus from 35% in 2009 to 55% in 2013.⁵⁴

As part of Maryland’s on campus composting program, Dining Services initiated the collection of food waste at the South Dining Hall and the Diner, which has diverted over 175 tons of food waste away from landfills to compost. In 2008, Dining Services eliminated the use of polystyrene containers and replaced them with bagasse containers, a byproduct of sugarcane fiber after the extraction of its juice, resulting in temperature tolerant, compostable, and biodegradable material for foods and liquids. In addition to utilizing bagasse containers, Dining Services also encourages students to use reusable takeout containers. These campaigns consequently led to a 15% reduction in the amount of takeout containers used and helped to offset the slight increase in cost for the bagasse containers. UMD composts food waste in four major locations: the Diner, South Campus Dining Room, 251 North, and at the Student Union. The average monthly food waste that was composted increased from 10 tons (2006) to 36 tons (2011).⁵⁵

The University has also adopted practices in an effort to reduce waste. Dining Facilities cook food to order to decrease the potential production of products that will go unused as well as leftover food waste. They have also extended the life of cooking oils by using micro-filtration, thereby reducing the use of cooking oils by 50%. To curtail the amount of single use plastic bottles and disposable cups, triple filtered water purification stations have been installed in seating areas of both resident dining rooms so that students have access to refill reusable or plastic water bottles. UMD has set the bold goal of going zero waste in all athletic facilities on campus, by diverting 90% of solid waste away from landfills and sending it to be recycled or composted. The university aims to improve waste collection systems by installing more

⁵⁴ <https://www.facilities.umd.edu/documents/waste%20report.pdf>

⁵⁵ <https://sustainability.umd.edu/get-involved/students/recycle-and-compost>

recycling and compost bins, implementing education and outreach programs, and creating condiment stations near food courts.⁵⁶

To establish Maryland's commitment to sustainability, the university published a Climate Action Plan in 2009, a Facilities Master Plan in 2011, and a Sustainable Water Use and Watershed Report in 2014. UMD became a signatory of the American College and University Presidents' Climate Commitment (ACUPCC). In the Climate Action Plan, goals were laid out to move UMD toward carbon neutrality by 2050 and a 50% reduction in greenhouse gas emissions by 2020. UMD has also laid out innovative goals to incorporate sustainability into student life and the university curriculum, while efficient resource allocation and waste minimization have become pillars in UMD's sustainability goals.⁵⁷

University of Minnesota

The University of Minnesota (UMN) has taken an inclusive approach in the field of sustainability by establishing a sustainability committee comprised of 25 faculty members from various departments. The sustainability committee at UMN developed a program called SELF Sustain, an annual workshop for students to connect and share their research and ideas regarding sustainability. The level of awareness and commitment to environmental stewardship within the student body was showcased by actions of The Next Generation Congress U of M student leaders when they were awarded the 2013 AASHE Student Leadership Award for successfully bringing the voices of youth on future policies to the Governor's Environmental Congress.⁵⁸

The University of Minnesota has also made an effort to incorporate sustainable methods into University infrastructure. System-wide projects to switch to high efficiency LED lighting fixtures in stairwells and parking ramps reduced energy costs by over \$275,000 in 2013, and the installation of solar panels on campus are used to power ZAP bike trap readers. ZAP is an automated bike commuting recognition system that incentivizes student bike commuting. As of 2013, UMN utilized 3 hybrid busses, 13 electric vehicles, and 77 hybrid vehicles on campus.

The University of Minnesota became a signatory of the American College and University Presidents' Climate Commitment (ACUPCC) in January 2008. A few years later in 2011, the University of Minnesota Twin Cities released a 115 page climate action plan, where they detailed the emissions of the University and the various way UMNTC plans on reducing them in the future.⁵⁹ This combination of efforts resulted in the reduction of electrical and thermal

⁵⁶ <http://dining.umd.edu/sustainability/waste/>

⁵⁷ <https://sustainability.umd.edu/progress/climate-action-plan-20>

⁵⁸ <https://cse.umn.edu/news-release/university-of-minnesota-students-win-national-sustainability-leadership-award/>

⁵⁹ http://www.sustaintc.umn.edu/assets/pdf/tc_climate_action_plan_1.1.pdf

greenhouse gas emissions by 22% between the years of 2008 and 2011, a significant mitigation effort considering that electricity and heating accounts for more than 80% of the university's carbon footprint.⁶⁰ UMN has set goals for further greenhouse emission reduction on each campus:

- Morris: 70% reduction by 2017
- Crookston: 10% reduction by 2020
- Duluth: 25% reduction by 2020
- Twin Cities: 49% reduction by 2021
- Rochester: 2% reduction by 2021

Pennsylvania State University

Pennsylvania State University (PSU) has done a significant amount of work to ensure that waste is disposed of appropriately. The university runs on a single stream recycling system and has composting procedures in place. Organic waste is ground, blended with fodder and stockpiled at the Penn State's Organic Materials Processing and Education Center (OMPEC). The compost is then used by Penn State crews as a nutrient-rich soil conditioner to enhance the quality of campus landscape. Currently PSU diverts 56% of its solid waste. With campus-wide composting that number will rise to 75%, and with other miscellaneous plastics up to 85%. PSU also donates leftover food to the Meals on Wheels charity program, which provides food for the elderly and the handicapped. Aside from its charitable and sustainable contributions to the community, PSU also provides students and staff with the option to use Green2Go containers to reduce the amount of Styrofoam containers. This program has allowed the university to significantly reduce the number of polystyrene containers being used as well as produced, and promotes an individual commitment to sustainability in university dining facilities.⁶¹

PSU has placed a strong emphasis on energy conservation and greenhouse gas reductions through initiatives in efficiency and awareness with an investment of \$60 million over five years. This has led to an 18% reduction in greenhouse gas emissions, but PSU has gone even further and set the goal of reducing emissions by 35% by 2020. PSU has also collaborated with the Borough of State College to develop a Bicycle Master Plan to increase the use of bicycles and therefore reduce transportation burdens. This program, along with use of biodiesel in university passenger and utility fleet vehicles, have played a vital role in reducing PSU's carbon footprint in regards to emissions from transportation.⁶²

⁶⁰https://www.uservices.umn.edu/sites/uservices.umn.edu/files/2013_regents_report.pdf

⁶¹ <http://sustainability.psu.edu/recycling-and-composting#recycling-composting>

⁶² <http://sustainability.psu.edu/energy-environment>

In an effort to incorporate sustainability into the university infrastructure, a University Sustainability Council appointed by Provost Rodney Erickson during the period April-December 2011 developed a Sustainability Strategic Plan.⁶³ The Council's goal was to "integrate sustainability in a way that adds value to our institution, communities, the Commonwealth of Pennsylvania, and beyond". The plan recommended that Penn State establish the Sustainability Institute, whose mission would be "to lead and support Penn State in the pursuit of sustainability across all functions (teaching and learning, research and discovery, outreach and engagement, administration and operations)". The primary goals of the Sustainability Strategic Plan were broken down into three subsections:

- Literacy - Having the understanding to recognize the need for change, act upon it, and recognize and reward the actions of others
- Solutions - Putting knowledge to work in our practices and approaches
- Leadership - Inspiring others and enlisting their aid in the common pursuit of innovation in policy, practice, and knowledge

⁶³ <http://sustainability.psu.edu/sustainability-strategic-plan>

University of Iowa

Through the Office of Sustainability, The University of Iowa created the Sustainability Charter Committee to advise on the integration of sustainability with existing campus programs in education, research, operations, and community outreach. The committee recommends policies, advises the university on practices pertaining to sustainability, and develops campus sustainability action plans. Members of the Committee, which is comprised of faculty, staff, students, and administrators, are chosen by the Senior Vice President of Finance and Operations, and confirmed both by the University President and the University Senate.⁶⁴

Sustainable dining practices have been introduced into the University of Iowa's dining facilities. In 2007, the University of Iowa and the Iowa City Landfill Recycling Center began a pre-consumer food waste composting pilot project that has now become University-funded program that composts over 80 tons of food and organic waste, with about 12 tons of food waste per semester originating from Hillcrest and Burge dining halls.

Although the University of Iowa only has about eight LEED certified buildings, a minimum standard of LEED Silver certification is required for all new construction and major renovations. The Pappajohn Institute for Biomedical Discovery Building was constructed in 2016 and is pending LEED certification. Additionally, the university has incorporated renewable energy sources such as Biomass fuel, wind turbines, and solar charging stations on campus.⁶⁵

The University of Iowa offers students a certification program in sustainability that requires the completion of three introductory course courses, four breadth electives; and one project/integrative system course. All of which may potentially counts toward requirements for a student's major or for a minor.⁶⁶

The University of Iowa published a 2010-2015 progress report where the University set bold goals for 2020 including:⁶⁷

- Becoming a net-negative energy consumer
- 40% renewable energy consumption on campus
- 60% waste diversion
- Achieve 10% reduction in per capita emissions of fossil fuel-produced CO₂ from university-related transportation and travel
- Increase Student opportunities in Sustainability
- Expand interdisciplinary research into sustainability
- Develop Partnerships to Advance Collaborative Initiatives, both Academic and Operational

⁶⁴ <https://sustainability.uiowa.edu/our-vision/sustainability-charter-committee/committee-charter-details/>

⁶⁵ <https://sustainability.uiowa.edu/our-vision/2010-2015-progress-report/>

⁶⁶ <http://sustainability.uiowa.edu/teaching-and-research/certificate/>

⁶⁷ <https://sustainability.uiowa.edu/our-vision/2020-vision-the-university-of-iowas-sustainability-targets/>

University of Wisconsin – Madison

In 2006, Facilities Planning & Management staff at the University of Wisconsin determined that improvements can be made in the areas of heating and cooling. UW launched the We Conserve program with a goal of reducing campus energy use by an additional 20 percent by the year 2010, but exceeded that goal and reduced energy consumption by 25%.⁶⁸

To reduce energy consumption, the We Conserve initiative remodeled more than 2 million square feet of space in campus buildings, including Engineering Hall, Chamberlin Hall, and the Chemistry Building. The efforts focused on upgrading air distribution systems, adding insulation in buildings and steam tunnels, and managing air handling and energy usage in laboratory spaces.⁶⁹

The We Conserve Program improved sustainability by annually reducing

- Energy consumption: 1.2 trillion BTUs
- Carbon dioxide emissions: 125,000 metric tons
- Water consumption: 178,000,000 gallons
- Diesel fuel consumption: 10,000 gallons
- Utility costs: \$13 million

In 2010, UW-Madison announced the UW–Madison Sustainability Initiative, which created a 17-member task force comprised of faculty, staff, and students. In 2012, UW–Madison created the Office of Sustainability. The office works to improve sustainability culture on campus by aligning environmental awareness with university goals, objectives, and activities. In 2013, a team of undergraduate students and UW-Madison won federal funding through the EPA’s People, Prosperity, and the Planet (P3) competition.⁷⁰ The team won funding to research effective and efficient ways to reduce and recycle Styrofoam takeout containers. After receiving additional funding the team merged with the Office of Sustainability and rebranded itself as Boxable: A Sustainable Shipping Coalition. The program has collected and recycled Styrofoam containers in 25 buildings on campus and has prevented over 80,000 pounds of greenhouse gas from entering the atmosphere.

⁶⁸ <https://sustainability.wisc.edu/about/history/>

⁶⁹ <http://news.wisc.edu/uw-madison-conservation-goals-heeded-and-exceeded/>

⁷⁰

<https://sustainability.wisc.edu/uw-madison-team-to-present-styrofoam-reuse-program-in-washington-d-c/>

The Ohio State University

The Ohio State University (OSU), in an effort to promote sustainability, created the Ohio State Sustainability Fund. The fund is available to faculty and staff members and provides funding for sustainability projects on campus. Sustainability Fund projects must promote sustainability by creating awareness programs, changing campus attitudes regarding sustainability, and advocating for more sustainable policies and developments at OSU.⁷¹ OSU also offers a sustainability certification program called the Green Buckeye Certification (GBC) with the goal of encouraging sustainability and improving the performance of campus offices and laboratories.

The Ohio State University established the President and Provost's Council on Sustainability to advise on the integration of sustainable practices, programs, and projects. The members of the council originate from various departments and disciplines.⁷² OSU ensures that student input is considered by including the President of the Council of Graduate Students, the Vice President from the Office of Student Life, and the President of the Undergraduate Student Government. In 2015, the council developed strategic sustainability goals to solidify OSU's commitment to sustainability. The goals were broken down into 4 subsections:

- Teaching and Learning
- Research and Innovation
- Outreach and Engagement
- Resource Stewardship

In 2015, President Michael Drake confirmed Ohio State as a signatory institution on the American College and University Presidents Climate Commitment.

⁷¹<https://president.osu.edu/assets/uploads/PPCS/Univeristy%20Sustainability%20Project%20Funding%20Criteria.pdf>

⁷²

<https://president.osu.edu/leadership-and-committees/president-and-provosts-council-on-sustainability.htm>
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Northwestern University

Northwestern University has established a comprehensive sustainability program that enhances their Evanston campus as well as the surrounding community. Although Northwestern has yet to publish a complete AASHE report, NU still participates in AASHE's Sustainability Tracking, Assessment & Rating System and recently revamped their sustainability website⁷³ to include interactive and educational components for putting the master sustainability plan into action. The NU Office of Sustainability has developed a working group, with representation from student groups and deans across school functions, for integrating sustainability into the curriculum. The university leadership has set a goal of reducing greenhouse gas emissions by 30 percent from the 2005 baseline⁷⁴. They also have a subscription based emailing list where you can receive constant updates about new events concerning sustainability. For their commitment to bettering the environment and reducing their carbon footprint, Northwestern received a Gold Campus Sustainability Awards from the State Governor of Illinois in 2013. Northwestern also produces their own Annual Sustainability Reports which includes data and information regarding their sustainability initiatives and efforts.

Northwestern provides online resources regarding the recycling Greek House Recycling, Off-Campus Recycling Resources and On-Campus Recycling Resources. Northwestern also hosts an annual challenge called the Green Cup⁷⁵. The Green Cup Challenge is a month-long competition that challenges Northwestern students living in campus residence halls and Greek housing to reduce energy and water use. It is a student-driven initiative with Students for Ecological and Environmental Development⁷⁶ (SEED) leading the effort. Students organized the first Green Cup in 2006 with the help of Facilities Management. The goal of Green Cup is to encourage students to adopt sustainable habits in their daily routines. Simple actions such as turning off lights and taking short showers can add up to significant energy and water savings.

Campus residences compete in four categories: residences with dining, residences without dining, fraternities, and sororities. Scoring is based on how much each residence is able to reduce energy and water consumption compared with a baseline for the individual residence. In addition, students can earn points for their residences by participating in sustainability focused events. In terms of programs and involvement, NU has an Eco-Rep program that includes a training handbook and free gifts for participants. The program has allowed students develop leadership skills while also advocating for environmental stewardship.

⁷³ <http://www.northwestern.edu/sustainability/>

⁷⁴ <http://www.northwestern.edu/sustainability/strategic-initiatives/annual-report/index.html>

⁷⁵ <http://www.northwestern.edu/sustainability/strategic-initiatives/index.html>

⁷⁶ <http://www.northwestern.edu/sustainability/about/strategic-plan.html>

Northwestern has been composting food since 2012. Every Evanston campus dining and food service operation participates in the program. Compostable items in the dining halls, Allen Center, and Norris University Center are collected and delivered to a local composting facility. The compost is then used in landscape and farming operations, where it is added to the soil, reducing the need for fertilizers.

Some other initiatives involving food and dining services include:

- A partnership program with Chicago Biofuels and the Loyola University Biodiesel Lab that recycles cooking oils. Vegetable oil from dining halls is refined to create biodiesel which is used to fuel campus shuttles. Leftover oil is also used to make eco-friendly soap, called biosoap.
- Filtered water stations are available in all resident dining locations providing students with easy refill options for reusable water bottles.
- All retail outlets offer a discount for patrons who use a reusable bottle or mug. Many items used, including napkins, coffee cups, and coffee sleeves, are made from post-consumer recycled content.
- Styrofoam plates and coffee cups have been eliminated from retail dining outlets.

University of Illinois - Urbana-Champaign

University of Illinois at Urbana-Champaign (UIUC) is also a leader in sustainability. With a gold rating by the AASHE STARS standards⁷⁷, UIUC is focused on innovation and real results. The Big Ten university has two dedicated committees for sustainability. The student sustainability committee is part of the Illinois University student government. It is run by all students and it funds around \$1 million worth of student and faculty led sustainable projects⁷⁸. The entire list of past and current projects are available on their easy to use and interactive website. Some of the current projects are listed below:

- Aquaponics Demonstration Unit which aims to test out the viability of a small scale closed ecosystem in which both plants and fish could grow in substantial quantities and be used in the dining halls
- Fermenting Foods to Reduce Food Waste which would make products like hot sauce, kombucha, sauerkraut, and many more
- Illinois Biodiesel Initiative where waste vegetable oil would be made into soap and biodiesel fuel

In December 2013, the University of Illinois created the Institute for Sustainability, Energy, and Environment⁷⁹ (iSEE) on the Urbana-Champaign campus. iSEE was officially established by the University's Board of Trustees with approval by the Illinois Board of Higher Education, A year prior in 2012, the Academic Senate had approved establishment of the Center for a Sustainable Environment (CSE). CSE was a merger of the Environmental Change Institute (ECI) and the Office of Sustainability (OS).

The second sustainability committee is led by faculty and focuses on broader sustainability goals. The faculty committee works with the student committee to produce lasting changes to the campus culture. They organize events such as iSEE congress, symposiums, and many lectures. UIUC have also created a Climate Action Plan known as iCAP⁸⁰. This highlights the sustainable goals the University has. By 2050, the University aims to make its net emissions zero. By 2020, the university aims to:

- Reduce campus energy usage and energy emissions by 30%
- Return emission levels from transportation to the 2008 baseline (reversing an observed 30% increase from FY08 to FY14)
- Reduce water consumption by 30%
- Reduce agricultural and landscape emissions by 30%

⁷⁷ <http://sustainability.illinois.edu/about/>

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<http://ssc.sustainability.illinois.edu/wp-content/uploads/2016/08/SSC-Annual-Report-2015-16-for-Web.pdf>

⁷⁹ <http://sustainability.illinois.edu/about/>

⁸⁰ <http://icap.sustainability.illinois.edu/>

Our Vision for the Future of Sustainability at Rutgers University

Rutgers University has the potential to emerge as a leader for sustainability among our peer institutions as well as on a global scale. There are a number of environmental issues that we believe Rutgers can address, solve, and therefore promote its sustainable excellence through.

The first prime example of Rutgers' commitment towards sustainable progress is our handling of food waste. The reduction of food waste on a university-wide scale is both environmentally conscious as well as economically beneficial. Although many of the dining halls have adopted policies that significantly contributed towards reducing food waste, our research⁸¹ has shown that an overwhelming majority of Rutgers students believe that the University needs to do more if we are to be considered a true leader in sustainability. Rutgers University has the third largest student dining system in the country, yet lacks a university-wide composting program, causing a grave concern due to the high production and consumption of food and materials. At present, ten out of the other 13 Big Ten Universities have a composting program in place to sustainably dispose of food and organic waste. While three of these schools do not have composting programs currently in place, including Rutgers, Michigan State University and the University of Illinois utilize anaerobic digesters to aid in the sustainable management of food waste and its conversion into energy instead. Our Task Force believes that Rutgers University-New Brunswick Facilities and Dining Services should reevaluate the current waste management policies in place and conduct research on the feasibility of an on-campus composting program or the installment of anaerobic digesters at Rutgers University. Additionally, the production and use of polystyrene at Rutgers New Brunswick can cause significant environmental damage as well as presenting a threat to the health of the student body. While eight out of the 13 other Big Ten universities have already eliminated all polystyrene products from their respective university facilities, Rutgers University-New Brunswick still uses polystyrene for the use of takeout containers. New policies should be enacted that would allow Rutgers to become more autonomous in the handling of its management of waste, while also being cognizant of the social and cultural boundaries that are present within the student body; addressing them with student oriented programs that will allow student leaders and student representatives to foster a relatable connection between the student body and the significance of the impacts that they create on their immediate environment. The Task Force recommends that Rutgers University eliminates all styrofoam products from university dining facilities and encourages university vendors to do the same. We believe that implementing this policy would be a serious step towards mitigating the university's impact on our regional and global environment.

⁸¹ RUSA Sustainability Task Force survey of 360 Rutgers - New Brunswick Students

There is no question that Rutgers University has taken strides to prove and improve its commitment to environmental stewardship and sustainability, however, our university comparatively lags behind our fellow Big Ten associates in many aspects regarding sustainable initiatives and mitigation of our impacts. A primary component of the hindrance towards more environmentally progressive practices and policies is due to the on and off-campus culture that is a result of the lack of education and emphasis on sustainability and its significance. Though Rutgers University has undertaken many large-scale projects such as the implementation of solar farms, many students are unaware of the university's efforts to reduce our collective environmental impact. This can be attributed to the lack of consistent publication of sustainability reports as well as an outdated sustainability webpage. We believe that Rutgers has the capacity to address this issue with the extensive amount of technological resources at its disposal, as the 13 other universities currently have an updated website that comprehensively breaks down the state of sustainability at their respective institution. Furthermore, universities like Northwestern and Michigan State have committed to publishing annual sustainability reports, while Rutgers has not published a report since 2007. These reports play an essential role in the benchmarking of our progress as a university and would allow Rutgers to compare itself to other universities within the conference and around the country. In an era of perpetual globalization and technological advancement, we recommend that Rutgers maintain a comprehensive and updated web page regarding sustainability at our university as well as increasing the frequency in which it publicizes its research and initiatives. By doing so, Rutgers would maintain increased transparency in regards to its findings and its upcoming projects and initiatives, thereby demonstrating a commitment towards shared governance and student involvement, participation, and responsibility to a global cause that affects each person at our university.

Rutgers University established The Committee for Sustainability in 2006, but has not yet established a physical administrative office dedicated to sustainability and environmental issues. Currently, ten out of the 13 other Big Ten schools have created an Office of Sustainability, with the only exception being the University of Minnesota; Michigan State University has created a department called MSU Sustainability within their department of Infrastructure Planning and Facilities, and The University of Illinois has created The Institute for Sustainability, Energy, and Environment (iSEE). Despite the recommendation of the Committee for Sustainability, Rutgers University administration has made no commitment to creating an Office of Sustainability. However, an Office of Sustainability would allow the university to hire full-time employees dedicated to improving sustainability at Rutgers, but would also create a hierarchy of leadership within the University administration, simultaneously providing students and student organizations with far more administrators and therefore resources to initiate their own projects and practices that are student body oriented, addressing campus cultural issues at the source. Although additional funding from within the University and from external sources may be

required, these investments will pay dividends in the future. The committee has concluded that if Rutgers wants to consider itself a leader in sustainability amongst other Big Ten institutions, the university administration must join the majority of Big Ten universities and establish an Office of Sustainability.

In 2009 Rutgers University Facilities and Capital Planning published a 34 page Sustainability Plan, but the long term goals of Rutgers University remain unclear. Ten out of the 13 other universities in the Big Ten Conference have published climate action plans that detail current initiatives as well status updates and statistics. These reports also contain long term feasible goals that each university has committed to achieving within a specific time frame. Brief sections have been dedicated to sustainability in the Master Plan and the Strategic Plan, but both contain platitudes that do not outline tangible sustainability goals for Rutgers University. The Task Force has concluded that Rutgers University should publish a climate action plan of its own to lay the foundation for future sustainable developments and to set a benchmark for future achievements. Furthermore the Sustainability Task Force urges Rutgers University President Dr. Robert Barchi to sign the Presidents' Climate Leadership Commitments (previously the American College & University Presidents' Climate Commitment), which has already been signed by over 600 colleges and universities throughout the country.

Recommendations

As Rutgers students we strive to follow the ideals of our university. We hope that our work causes the "sun of righteousness, [to] shine upon the West also" (Rutgers University Motto). In this sense, we hope that Rutgers University continues to take the steps to bring enlightenment and a sense of responsibility for the environment to our campus. In general, we believe that in order to espouse these ideals the University needs to take proactive steps to increase involvement of the student body and the Rutgers community in sustainability initiatives. As the mission of the university is to educate and in a greater sense set an example for others, we must commit to working with our community on sustainability initiatives. The Sustainability Task Force after our year-long journey and exploration of sustainability has identified specific recommendations that we believe will exemplify Rutgers' status as a leader in sustainability.

We hereby recommend that Rutgers University:

1. Create an Office of Sustainability
 - a. The office should be created on a university wide level to encourage all subunits of Rutgers to be sustainable
 - b. The office should consider input from the Rutgers Community by working with the Committee for Sustainability and the Rutgers University Student Assembly (RUSA)
2. Publish a Climate Action Plan
 - a. The plan should outline analyze and provide relevant data on the waste produced, energy expended, emissions by the university, water usage, land usage, transportation, and student awareness on sustainability issues
 - b. The plan should outline the steps the university plans to take to reduce its carbon footprint
3. Commit to publishing annual sustainability reports or updates similar to the one published in 2007 by the Committee for Sustainability
 - a. Maintain and update the Sustainability website with current and future large and small-scale research, initiatives, and projects
4. Incorporate sustainability into the core curriculum of all Rutgers Students
5. Discontinue the purchase of styrofoam products for university dining facilities
 - a. The university should adopt and implement the use of biodegradable and compostable takeout containers
 - b. The university should contractually prohibit styrofoam, whenever possible, in packaging
6. Reevaluate the current waste management procedures and analyze the feasibility of a university wide composting program
 - a. Use the Environmental Protection Agency's Food Recovery Hierarchy as a model for food waste management in university dining facilities
 - b. Conduct an internal review of current waste management policies
 - c. Conduct a breakeven analysis and a cost/benefit analysis of a composting program
 - d. Publish the findings and conclusions into a report accessible to all members of the Rutgers community
7. Adopt the Sustainability Committee as a standing committee in the Rutgers University Student Assembly (RUSA)
8. Obtain certification in the Sustainability Tracking, Assessment & Rating System (STARS) program overseen by the Association for the Advancement of Sustainability in Higher Education (AASHE)
9. Become a signatory institution in the Presidents' Climate Leadership Commitments (previously the American College & University Presidents' Climate Commitment)