WPI

Sustainability Report
2015-2016

wpi.edu/+sustainability
green@wpi.edu

Table of Contents

What is Sustainability?

According to the Environmental Protection Agency, "To pursue sustainability is to create and maintain the conditions under which humans and nature can exist in productive harmony to support present and future generations." This definition encompasses the three aspects of environmental stewardship, social justice, and economic security for all people. WPI strives to implement these principles by operating the campus in a sustainable manner, by incorporating the principles of sustainability throughout our academic programs, by carrying out research that advances theory and practice in this critical area, and by positively impacting our communities.

Letter from the President

In my two years as president, I have seen great strides in sustainability at WPI. At the end of 2015, we released WPI's new strategic plan, Elevate Impact, which includes sustainability among its keys to success. The theme of impact reflects how WPI positively affects the lives of our communities through the WPI Plan. Our project-based learning is not limited to theory and practice; it demonstrates our impact: A Great Problems Seminar, entitled Table for Five, launched a Food Recovery Network Chapter whose mission is to recover good quality food for the underserved in our own community. A third-year project in Colombia focused on providing sanitation solutions for informal settlements. And a graduate project is researching tethered underwater kites for power generation.

This year we continued to strengthen the structure of our Office of Sustainability with the newly formed Sustainability Advisory Committee and the Student Sustainability Leaders Forum. These groups provide both external perspective and internal connections as we develop sustainability-themed initiatives in collaboration with departments and centers across WPI. In campus operations, building retrofits improved energy efficiency; transportation options were increased with a new bike share program; and over 1000 gallons of gasoline were saved through the use of electric vehicle charging.

Members of our community engage in many ways to improve our world. We mentor elementary and middle school students, deliver meals to local shelters, winterize homes, fundraise for over 130 nonprofits, and educate our peers about inequities around the world as well as the global climate crisis. And our students carry these passions with them as they graduate from WPI.

This report highlights our successes, but it also identifies areas for improvement. Our Plan for Sustainability continues to guide us. We look forward to researching and implementing methods to reduce water and gas consumption and waste generation, and to identifying innovative measures of our progress. We continue to develop new ways to engage more members of the community in all areas of sustainability to broaden our impact in the local community and around the world.

WPI Sustainability Executive Summary

Operations

30% recycling rate

12.1% decrease in overall waste in the past year

28% local food purchases

5.1% increase in natural gas consumption (normalized by degree days) since FY14

21.8% increase in water consumption since FY14

14.1% decrease in electricity usage since FY14

1788 checkouts in the first 73 days of Gompei's Gears

199,642 kWh savings predicted for retrofits in 3 buildings

Academics

2 majors, Environmental Engineering and Environmental and Sustainability Studies

3 sustainability-focused on-campus project centers

26 entries in the Sustainable Futures Project Competition

30 graduate sustainability-related courses

40+ global project centers on 6 continents

119 undergraduate sustainability-related courses

Research & Scholarship

4 sustainability-focused research centers

59 faculty or staff actively engaged in sustainability research

$750,000 granted by NASA for circuit-cooling research

$1 million granted by US Battery Consortium LLC for lithium-ion battery research

Community Engagement

1 drive electric event

34 rainwater harvesting systems installed in Guatemala

130 nonprofits received **$169,477** from student fundraising

3,500 LED light bulbs distributed

34,890 community service hours

185,000+ pounds of food donated

Campus Facts

- 95 acres of total campus property
- 6690 FTE (full-time equivalent student, faculty and staff)
- 2.3 million square feet of buildings
- 4 LEED certified buildings:
  - East Hall, Gold
  - Recreation Center, Gold
  - Faraday Hall, Silver
  - Bartlett Center, Certified

WPI Sustainability Awards

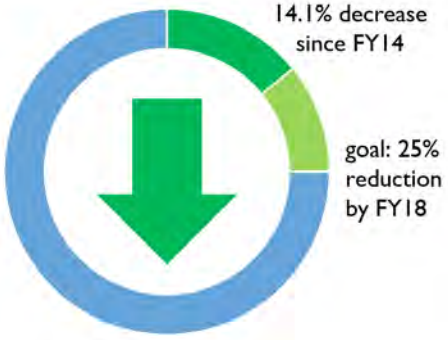
- AASHE STARS Silver
- Princeton Review Green Schools
- Sierra Club's Cool Schools
- Bernard M. Gordon Prize for Innovation in Engineering and Technology Education
- Massachusetts Eco Award

Operations

WPI is committed to reducing its impact on the environment by considering sustainability in building construction and renovations, promoting sustainable operations and maintenance practices and investing in energy-efficient equipment and appliances. By reporting and monitoring our energy and water consumption, we have the opportunity to assess and take corrective action in areas where improvements are needed.

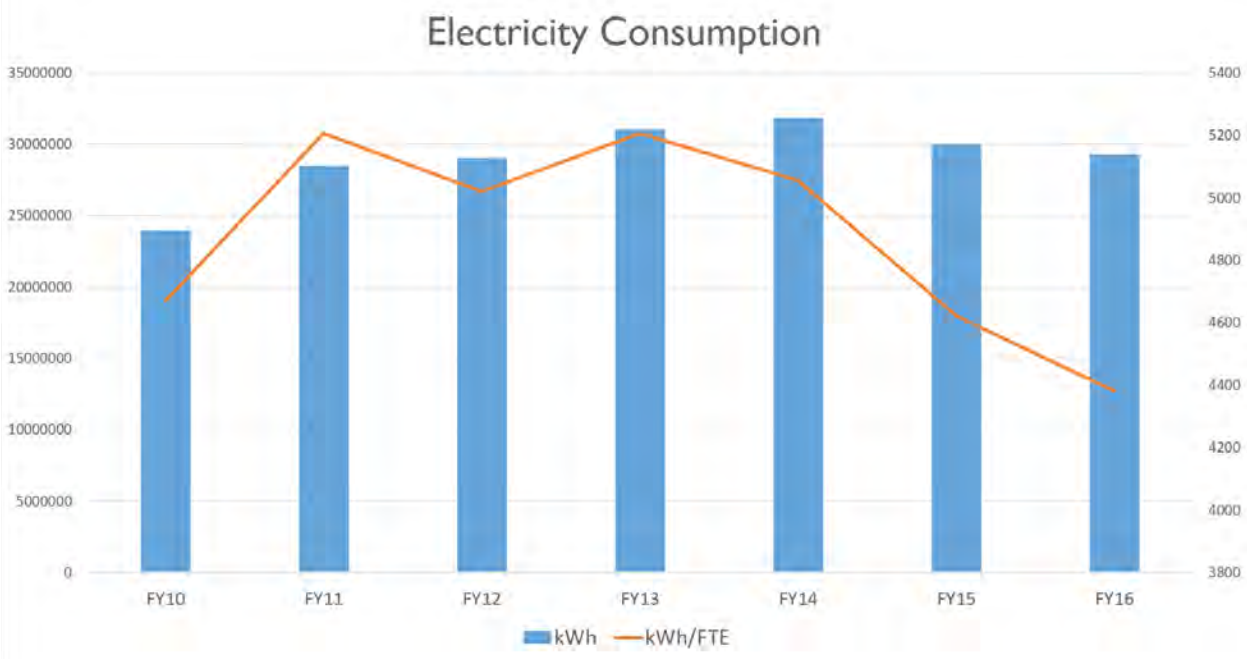
In the Sustainability Plan, adopted in FY14, the Office of Sustainability's goal is a 25% decrease in utilities consumption by the end of FY18.

Electricity

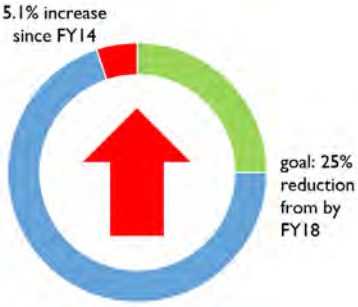


The overall consumption of energy this fiscal year has decreased 691,296 kWh since 2014-15. The electricity consumption per FTE has decreased 14% since 2013-14, a total of 714.94 kWh.

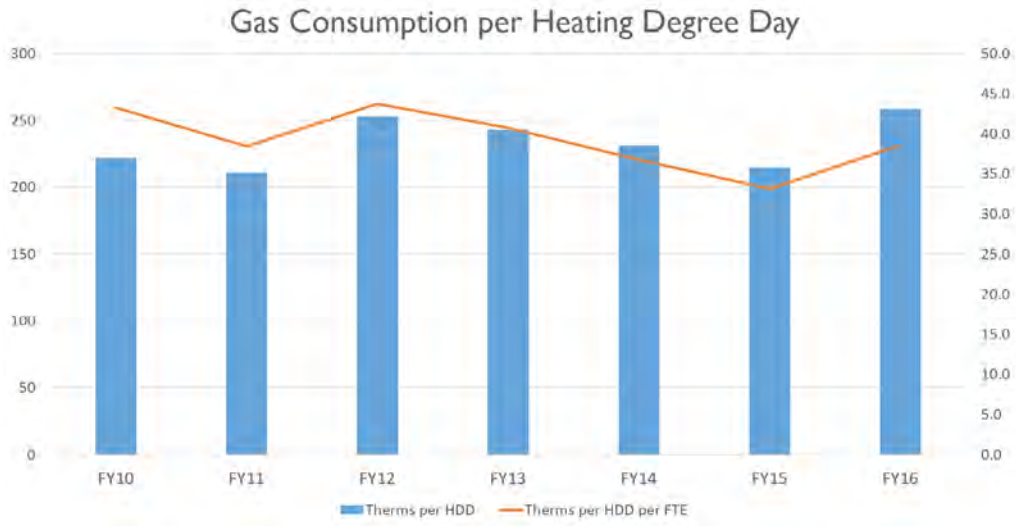
714.94 kWh per FTE = powering a 60W equivalent LED light bulb for **8 years**!



Heat

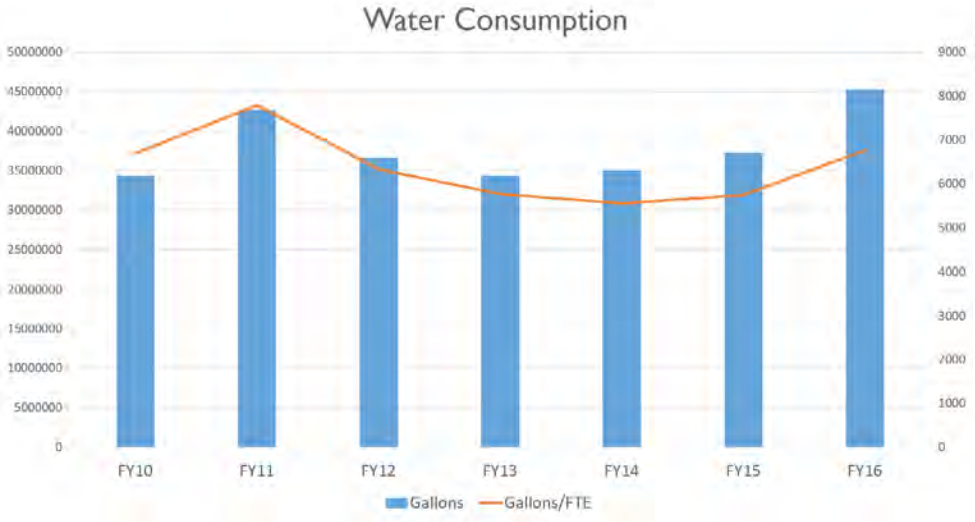


The amount of gas consumed this year was 5,755.3 therms less than last year, but when normalized by heating degree days there was a 16.6% increase since FY15 and a 5.1% increase since FY14.



*Gas consumption is affected by the number of heating degree days (HDD), which takes into account the temperatures and days in which heating would have been necessary.

Water

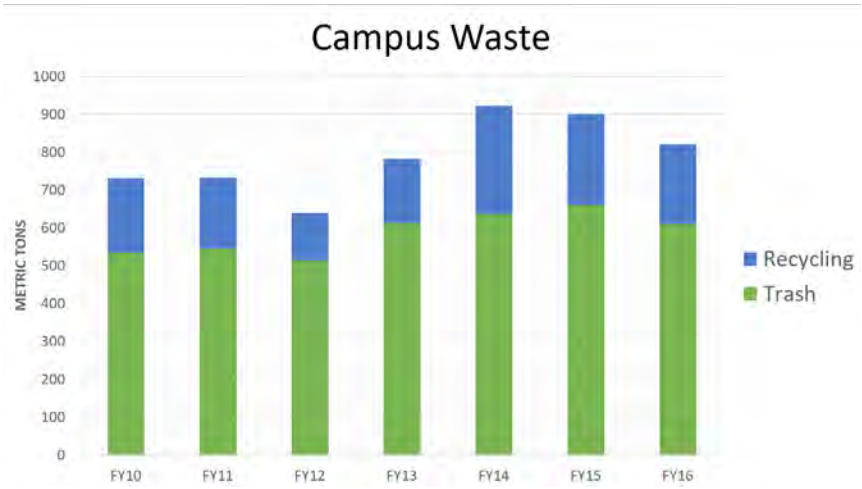


This year, we increased our campus water consumption by 7,982,521 gallons, a 17.8% increase per FTE. We have had a 21.8% increase in consumption since FY14

7,982,521 gallons = filling up the Bartlett Center **3.3 times**!

We have installed 4 additional water bottle filling stations since last year, increasing the total stations to 36.

Waste & Recycling



Recycling Rate

Recyclemania Results

38% Cumulative Recycling Rate

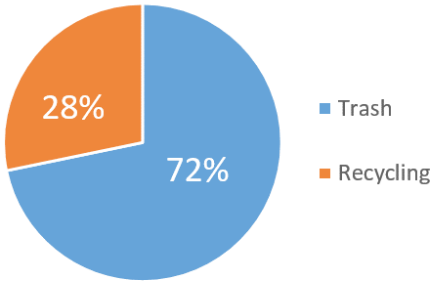
63.45 pounds of waste per person

5264 lbs recycled at the E-Waste Drive co-sponsored by the Student Green Team and the Department of Facilities

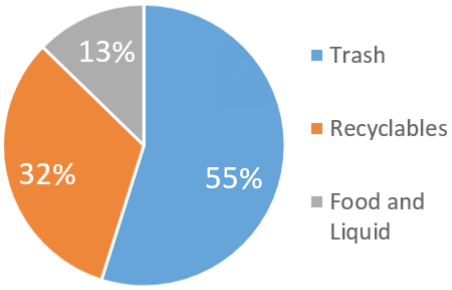
"I was most surprised about the need for recycling different metals and batteries especially and even glass, since most people just think just paper and plastic are the most important materials to recycle."
–Angela MacLeod, '19

Campus Waste Audit Results

Present Rate



Potential rate



The Waste Audit was done for 3 buildings: Campus Center, Daniels Hall and Gordon Library. After considering the food waste that could have been diverted, the potential recycling rate is 45%.

Retrofits

Upgrades to Gordon Library's restrooms and HVAC system occurred during the summer of 2016. The 50-year-old HVAC system has been replaced and will have improved climate control technology and thermal efficiencies. The restrooms are better equipped for handicap accessibility and have new water conserving appliances and air-powered hand dryers. Additionally, GreenerU, WPI's partner in sustainable energy solutions, conducted three major retrofitting projects in 2016. They consisted of upgrades to three buildings: Atwater Kent Labs, Alden Hall and Morgan Hall.

Atwater Kent Labs

HVAC upgrades and optimization, occupancy sensor installation, weatherization, lighting and control upgrades

Total Annual Electricity Savings:
371,388 kWh

Total Annual Natural Gas Savings:
1,842 MMBtu

Total Annual Cost Savings:
$67,019

Morgan Residence Hall and Dining Services

HVAC system upgrades and optimization, kitchen hood control, lighting and lighting control upgrades, weatherization and insulation, walk-in coolers control

Total Annual Electricity Savings:
470,582 kWh

Total Annual Natural Gas Savings:
2,212 MMBtu

Total Annual Cost Savings:
$83,161

Alden Hall

HVAC controls upgrade and optimization, lighting controls and upgrades to LEDs, variable frequency drives on fans and pumps

Total Annual Electricity Savings:
299,105 kWh

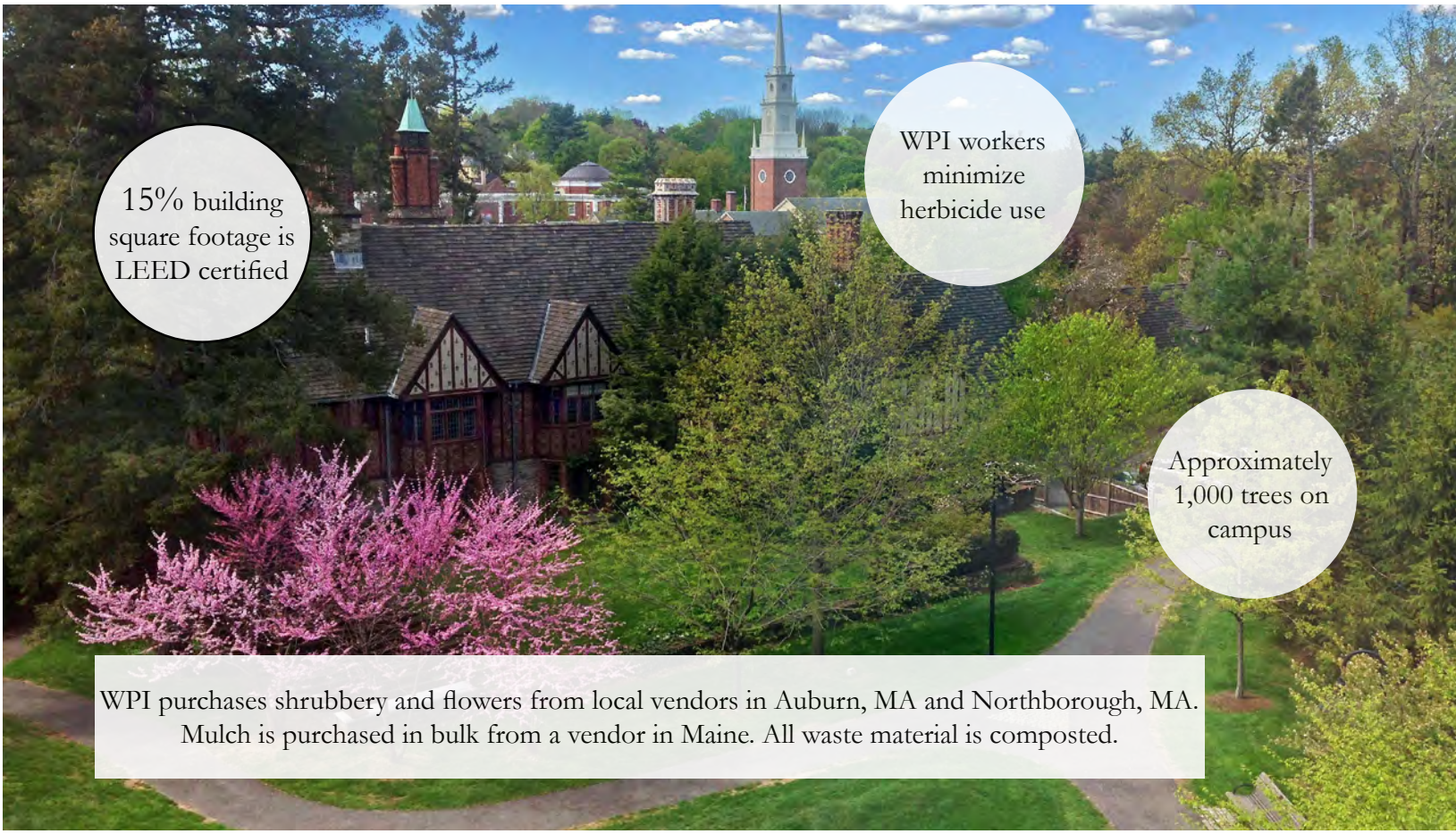
Total Annual Natural Gas Savings:
1,113 MMBtu

Total Annual Cost Savings:
$49,462

Lamba Chi Alpha wins the Greek Alumni Council Sustainability Award!

ΛΧΑ is a fraternity that practices energy conservation; last year they invested in new, more energy efficient windows for their house. The fraternity runs a recycling program with Chandler Street Bottle Return, where the money they make gets donated to Grier Strong and other philanthropies. They also collected 183,217 pounds of food in November that was donated to the Friendly House of Worcester for the holiday season.

Buildings and Grounds



Foisie Innovation Studio

Construction on the Foisie Innovation Studio has begun! The project is due to be complete by the summer of 2018. This 78,000 sq. ft. residential, academic, and meeting space will feature:

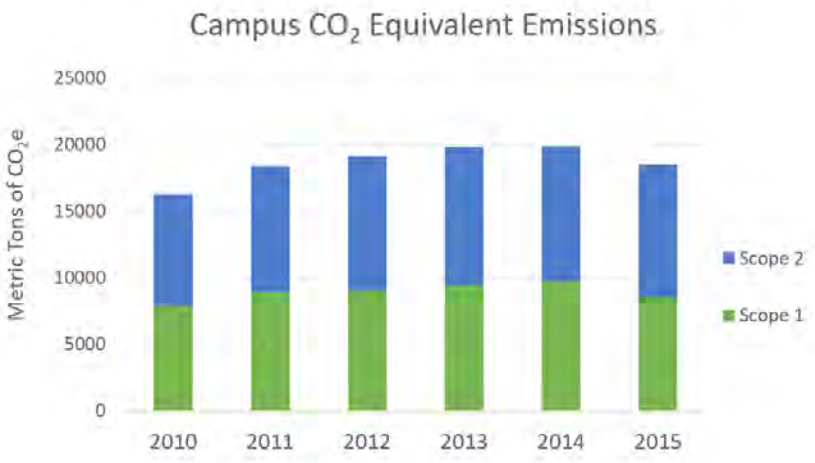
- LEED Certification
- Energy efficient climate control equipment
- LED lighting
- Water conserving appliances
- Housing for 140 students

Emissions

WPI reports and monitors the amount of greenhouse gas that is released into the atmosphere so we can accurately determine our carbon footprint. There has been a 7% decrease in total emissions compared to 2014*, a total of 1,402 metric tons.

1,402 metric tons = the weight of **779 cars!**

WPI Office of Sustainability is currently in the process of developing a GHG Reduction Plan.



*Emissions are measured per calendar year, rather than fiscal year

Scope 1: These are the GHG emissions from sources that are owned by WPI, including any fossil fuels burned on site, WPI-owned and leased vehicles and refrigeration losses
Scope 2: These indirect emissions are from the electricity WPI purchases from the grid

Transportation

WPI offers students and employees numerous transportation alternatives. An important objective is to decrease the number of single occupancy vehicles coming to campus while providing mobility options to our students and staff.

Transportation options offered for free or discounted to students and staff:

- Woo Bus
- Carpool World
- Gateway Shuttle
- SNAP
- Community Service Van
- CityRide
- Knight's Airport Limo
- Zipcar
- Gompei's Gears Bike Share

WPI Goes Electric

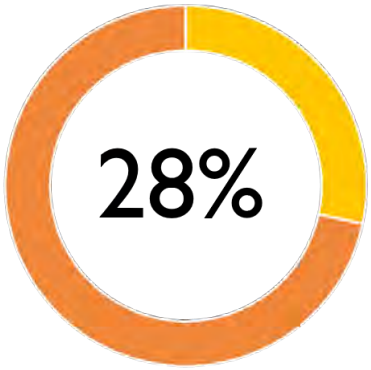
There are 2 dual ChargePoint electric vehicle charging stations on campus.

8226.27 kWh used
1032 gallons of gasoline saved
3455 kg of GHG emissions diverted

Dining Services

Chartwells, WPI's dining service, is committed to ensuring that students are offered healthy and sustainable food options in dining halls. WPI purchases produce, dairy and seafood locally, reducing the amount of GHG emissions due to transportation of products. Chartwells has launched several sustainability-focused initiatives.

28% of our food purchases are sustainable, meaning purchased locally* and/or are certified as ecologically sound



*based on a 150-mile range

Meet Your Local Vegan!

This program is run by WPI's dietician and is designed to provide information to students about the health and sustainability benefits of eating a vegan or vegetarian diet. Two education sessions were held, and a vegan guest was invited to answer questions and share experiences. Food samples were provided to give students a taste of what it is like to be vegan.

Gompei's Gears

In search of an alternate form of transportation on campus, students Kevin Ackerman and John Colfer researched university bike shares as a part of their IQP project. Once the project was completed in 2015, Kevin took it one step further - implementation on the WPI campus. With funding from both SGA and GSG, two student government organizations, plus the Department of Facilities and the Office of Sustainability, the project become a reality.

The Bike Share Launch event occurred in April. President Leshin was a featured speaker and the event was widely attended by students, staff and faculty. Free helmets were provided to the community to encourage safe riding.

Learn more about the bike share: wpi.edu/+bikeshare

The WPI Green Team administers this program, which runs year-long with the exception of the months of December, January and February. All maintenance for the bike share is done by students. The fleet of 16 bikes is located strategically throughout campus for convenient checkouts.

How Has the Program Been Received?

1788 checkouts*

664 community members registered*

*Between April 19 and June 30, 2016

Students and staff have been spotted all over Worcester on Gompei's Gears bikes and have showed great enthusiasm about the program!

Even the city and state are excited about Gompei's Gears!

The Worcester Regional Chamber of Commerce asked Kevin Ackerman to present during a community meeting in late May 2016. Additionally, MassRides has requested the use of Kevin's research information as a template for other institutions interested in bike shares.

Academics

WPI is committed to the integration of sustainability concepts throughout our academic programs. Sustainability is incorporated into our undergraduate project-based curriculum via our Interdisciplinary and Major Projects, both on campus and across the globe. Our graduate program features a broad range of sustainability-related research, from advanced batteries to sustainable supply chain management.

119 undergraduate sustainability-related courses

30 graduate sustainability-related courses

87% of all departments offer at least one sustainability course or course that includes sustainability topics

Coming Soon!
Sustainability Engineering Minor

An academic minor in Sustainability Engineering was developed this year and is moving through the approval process. Every engineering discipline impacts the environmental and social sustainability of the planet, and knowledge of the principles of sustainability in engineering design will contribute substantially to professional practice.

Great Problems Seminar

This project-based class lets first-year students tackle important, real-world problems, particularly those involving sustainability. This GPS course also helps prepare students for their junior and senior projects, the IQP and MQP.

Some highlight projects:

- *A Renewable Energy Program for Bishop Kodji, Nigeria,* Arial Goldner, Travis Roth, Gunnar Tornberg, Alexandra Wheeler, Jackson Whitehouse
- *Rooftop Rainwater Collection System on Foisie Innovation Studio,* Nolan Bell, Dylan Flety, Chenggu Wang, Katherine Williamson
- *From Trash to Cash: Helping Paraguayan Waste Pickers Turn Glass from the Streets to Money in their Pockets,* Tess Hudak, Muhammad Hussian, Angela MacLeod, Daniel Ottey, Rasheeda Samih

GPS Courses include:

- Power the World
- Food Sustainability
- The World's Water
- Recover, Reuse and Recycle
- Livable Cities

"In some ways I felt as though this ability to innovate, create, and produce our own results was the most rewarding piece of the puzzle that GPS provided." –Toni Joy, *Fuel Poverty in Lawrence, MA*

"Personally, I chose rain gardens because it is closer to social science research. We will have a lot more opportunities to participate in technical research at WPI. GPS class is a good place to combine both types of research."- Qindong Zhang, *Rain Gardens in Worcester*

Sustainability Project Centers

Interactive Qualifying Project (IQP)

At WPI, students are given the opportunity to apply engineering solutions to real world problems, often in fields of sustainability. A majority of the off-campus sites have a substantial component of sustainability, and three of our on-campus project centers focus primarily on sustainability.

Energy Sustainability Project Center- directed by John Orr

Solar Energy Harvesting at the Sustainability Hub, Jacqueline Campbell, Sakiynah Howard, Zilu Tian

A new Center for Project-Based Learning was launched at WPI to assist other universities in understanding and adopting our uniquely effective approach to undergraduate education through the integration of real-world projects with classroom learning. The center delivers workshops and provides on-site consultation visits by experts, as well as tools for implementation of project activities.

Sustaining WPI Project Center- directed by Suzanne LePage and Fred Looft

Advancement of WPI's Sustainability Engagement and Education, Megan Andresano, Kenuel Lopez Rivera, Tucker Martin, Sai Sett Paing, Kyle Piette

Sustainable Food Systems- directed by Robert Hersh and Lisa Stoddard

Designing a BioShelter for Worcester Schools, Eric Chang, Jeremy Lane, Brendan Sullivan,Aaron Vien

Going Global

Off-Campus IQPs

WPI is dedicated to giving students the opportunity to gain an international perspective with the Global Projects Program. Students travel for a period of seven weeks and work to create sustainable solutions to real problems in countries across the globe.

Learn more about the Global Projects Program: www.wpi.edu/academics/undergraduate/project-based-learning/global-project-program

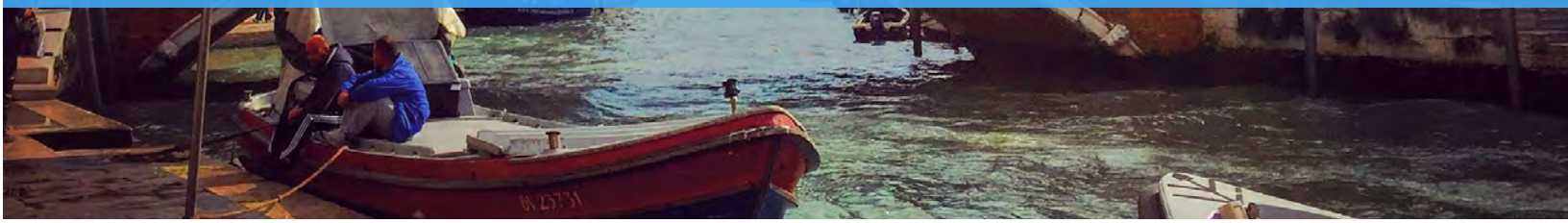
Scott Jiusto, Associate Professor of Geography, wins the Council for the Advancement and Support of Education (CASE) Professor of the Year award for Massachusetts for his contributions to the Global Projects Program. He has documented his teams' experiences at the Cape Town Project Center on a website, wp.wpi.edu/capetown/. Jiusto says the website is becoming a "demonstration of how universities can educate students and support local sustainability efforts."

Thessaloniki, Greece
Alternative Waste Treatment: Designing a Floating Island that Integrates Social & Technical Elements at the American Farm School, Eric Fast, Mary Prescott, Talia Solomon, Meghan Trahan

San Jose, Costa Rica
An Analysis of Environmental Certification in Costa Rica, Samantha Bircsak, Kelsey Messina, Joseph Moynihan, Jackson Oliva

Panama City, Panama
Food, Energy, Water (FEW) Nexus Analysis in the Panama Canal Watershed, Michael Beinor, Sarah Bucknam, Veronica Delaney, Sarah Terwilliger

Worcester, MA
Dismas House: Micro-Wind Turbine Feasability Study, Anthony Capuano, Rachel Cody, Andrew Kenyon



Major Qualifying Project (MQP)

While there is no requirement that the Major Qualifying Project address sustainability, many students do address some aspect of this broad area in their capstone work in engineering, science, or business. A frequently selected research topic is the development of sustainable energy sources.

"Since President Leshin's inauguration, there has been this idea of WPI's third tower being 'impact.' With my biogas-fuel cell project, I think one thing that made it so successful is its practicality and ability to incorporate readily available resources. The uniqueness of the model, but also the practicality of it, truly embodies WPI's three towers of theory, practice, and impact."

- Courtney Jones, *Performance of Biogas-Fed Solid Oxide Fuel Cells*

Energy Sustainability Project Center

- *Solar Methanol Electrolyzer*, Oliver Lizotte, Joseph Pizzuto, Thomas Cormier
- *Small, Sustainable Wind Energy*, Stacey Chaves, Isabella Sanchez, Eduardo Sandoval

Additional Projects

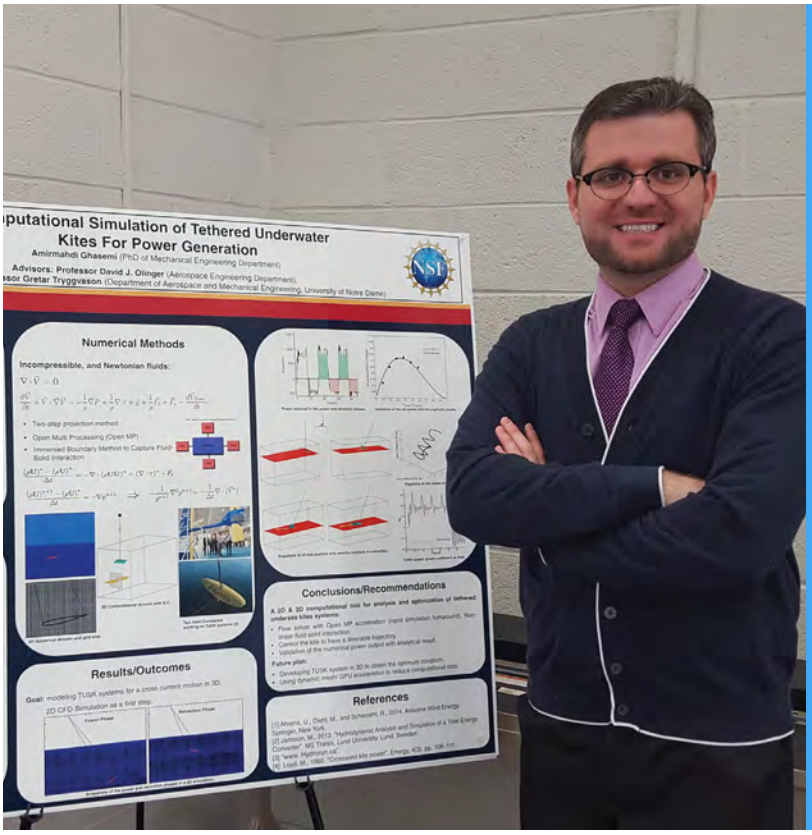
- *Engineering an Education for Affordable, Sustainable Rainwater Harvesting*, Katherine Picchione
- *Design of a Novel Concept for Harnessing Tidal Stream Power: A Continuation*, Katrina Bradley
- *Design and Testing of Power Cycle Concepts for the WPI Kite-Powered Water Pump*, Jessie Ciulla, Abdulrahaman Jilani, Joseph Samela, John Scarborough
- *Liquid Metal-Air Battery for Energy Storage*, Victor Hu, Huyen Vu , Jacob Zagorski

Sustainable Futures Competition

This competition was created to showcase students' sustainability-themed projects, and is open to first-year through graduate students. The winner of each category receives a $200 prize.

Competition Winners:

First Year- *Table for Five*, Alyssa Konsko, Alex Kuros, Ben Leveillee, Nathan Pietrowicz, Austin Shrewsbury (pictured right)
Undergraduate- *Performance of Biogas-Fed Solid Oxide Fuel Cells*, Courtney Jones (pictured left)
Graduate- *Tethered Undersea Kite Simulation*, Amirmahdi Ghasemi (pictured below)



"There are three basic sources of renewable energy: sun, wind and water. Of the three, water is the only one that is reliable, consistent and not dependent on the weather that day, or that season. We need to start moving our focus on renewables to the oceans."
- Amirmahdi Ghasemi

Research & Scholarship

As a leader in sustainability, WPI aims to be on the cutting edge of sustainability research. Our research centers and dedicated professors are advancing knowledge in areas from energy efficiency and electronics recycling, to social and economic implications of sustainable actions.

59 faculty or staff are actively engaged in sustainable research

87% of academic departments have at least one faculty or staff member conducting sustainable research

$2.9 million given in grants to sustainability research

SPOTLIGHT: Professor Marion Emmert

Marion Emmert's research, which has been ongoing for four years, involves recovering rare earth metals from the magnets in electric car batteries. This technology will eventually be applied to any electronics with a magnet in it, even our cell phones! BBC's series Horizons featured a video on Emmert's research in May 2016. Her research is unique because it is one of the only research projects in the recycling category that incorporates the 12 principles of "Green Chemistry." She is more recently working on a project to separate individual rare earths by their molecular size.

Research Centers

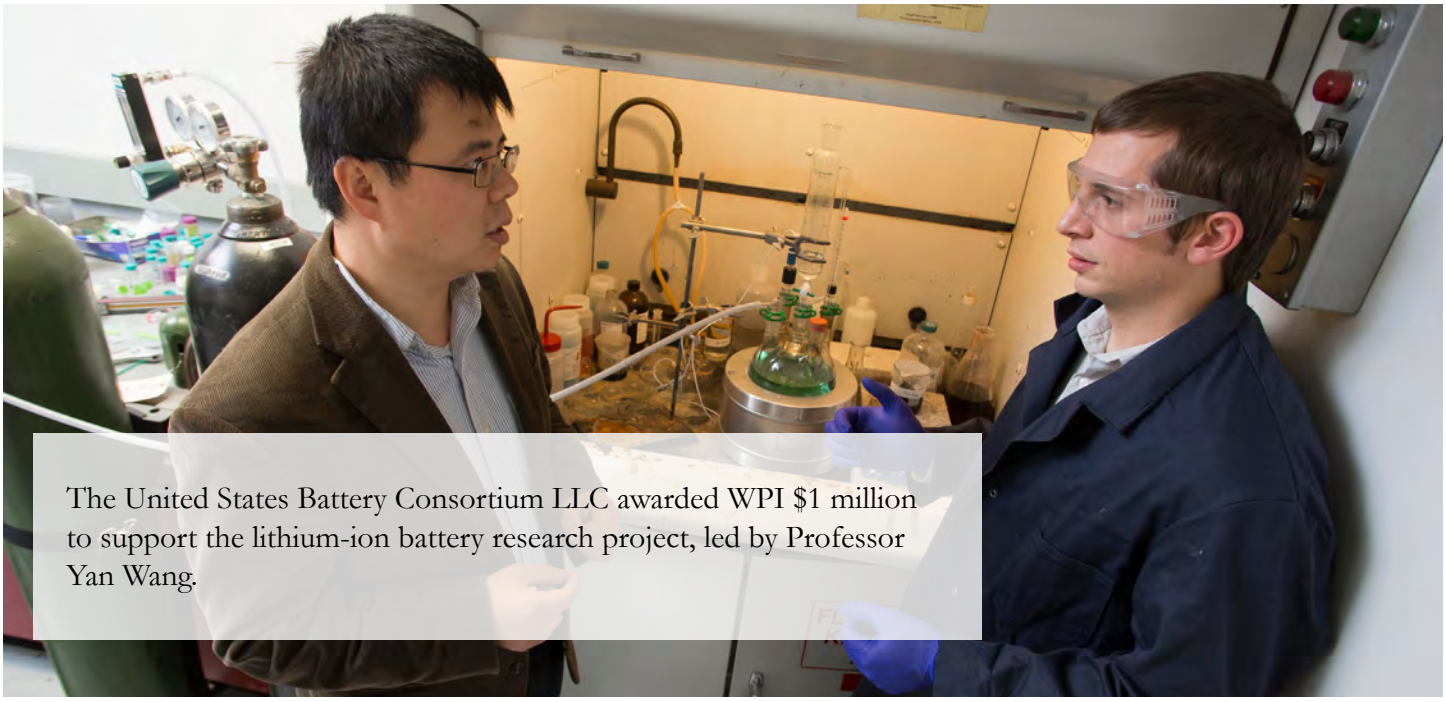
Center for Resource Recovery and Recycling

This center is a unit of the Metal Processing Institute (MPI) located at WPI. Some noteworthy projects that took place within this center in 2015-2016 are:

- *Rare Earth Recovery from End-of-Life Motors Employing Green Chemistry Design Principles,* Marion Emmert, H.M. Dhammakima Bandara, Kathleen D. Field
- *Automotive Aluminum Recycling at End of Life: a Grave-to-Gate Analysis*, Diran Apelian, Sean Kelly
- *Fundamental Study of Lithium Ion Battery Recovery*, Yan Wang

NASA Sponsors Circuit Cooling Research at WPI

The Center for Research in Advanced Drying, directed by Jamal Yagoobi, is involved in a research project on cooling circuits efficiently in the absence of gravity. WPI has been awarded $750,000 by NASA to work on this heat transport technology and its application to space equipment. The project will be tested in the International Space Station in 2020, and undergo experimentation for two years.



The United States Battery Consortium LLC awarded WPI $1 million to support the lithium-ion battery research project, led by Professor Yan Wang.

Research Centers

Center for Sustainability in Business

This center is led by Joseph Sarkis, a researcher, professor, and Foisie School of Business department head. Some of the center's projects include:

- *Carbon footprint of global passengers cars: Scenarios through 2050*, Joseph Sarkis, Yong Geng and Han Hao
- *Making Real Progress Toward More Sustainable Societies Using Decision Support Models and Tools*, Joseph Sarkis, Donald Huisingh, Ernesto Gonzalez

> "It is my belief that transformational leadership, doing and supporting environmental issues because you truly believe in them and value them to be the best type of leadership. You can put money and resources in it, but I think the values of the leader need to be there to be effective in the long term." -Joseph Sarkis

Other research centers at WPI that include sustainability-related research:

- Water Resources Center, directed by Karen Oates
- Integrative Materials Design Center, directed by Diana Lados

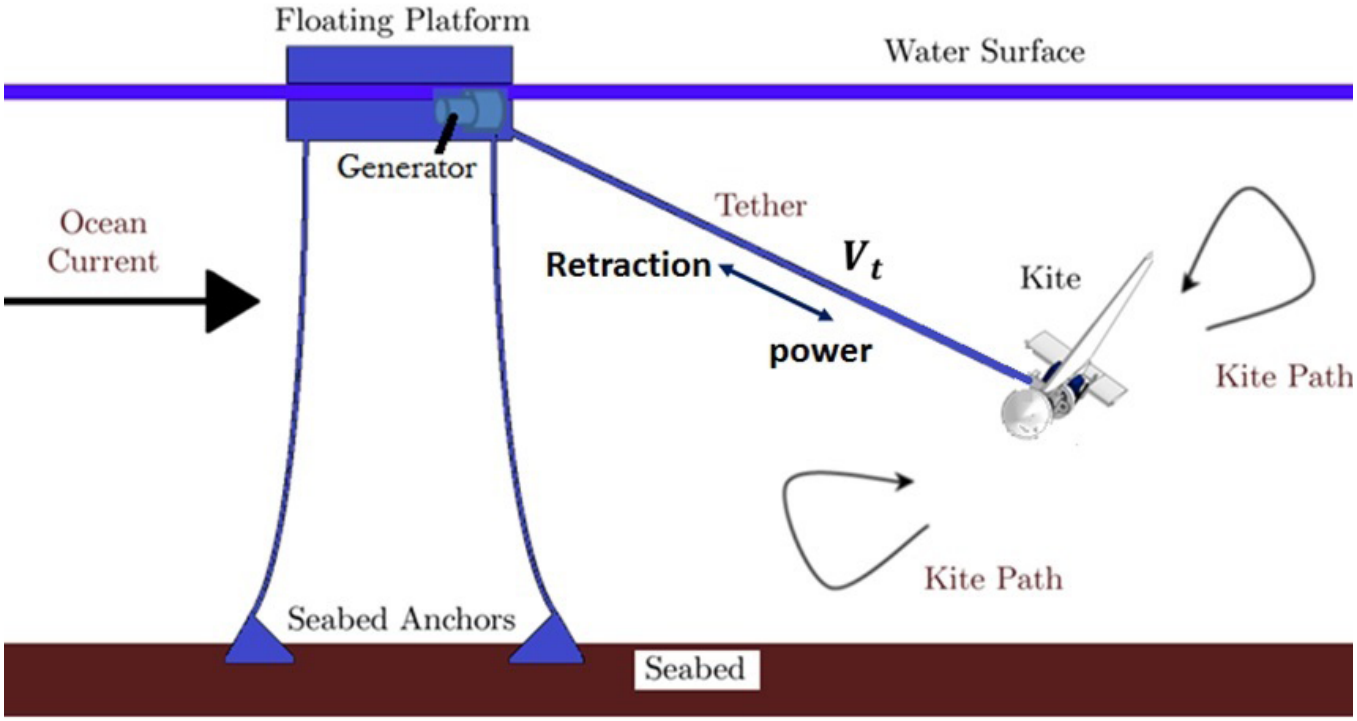
A complete list of research centers: www.wpi.edu/research/areas/centers

Here is a snapshot of a few other research projects in sustainability:

- *Performance of a Pavement Solar Energy Collector,* Gert Guldentops, Alireza Mahdavi Nejad, Cedric Buye, Wim Van den bergh, Nima Rahbar
- *Impact of Wind-Energy Generation on Climate: A Rising Spectre*, S.A. Abbasi
- *Hard Rain Gonna Fall: Strategies for Sustainable Urban Drainage in Informal Settlements,* Scott Jiusto, Macauley Kenney
- *System Safety Analysis of Large Wind Turbines*, Xin Jin, Wenbin Ju, Zhaolong Zhang

Winner of Sustainable Futures Competition, Graduate Level: Amirmahdi Ghasemi, *Tethered Undersea Kite Simulation*

Ghasemi is a PhD Candidate of Mechanical Engineering. His research with Professor David Olinger has been ongoing. His portion of the project has been focused on the actual program that simulates the movement of the kite in certain water speeds and analyzes the energy that can be obtained from it.



Pamela Weathers - 2015 Kalenian Award recipient

Weathers is doing research on using the dried leaves of the plant Artemisia annua for medicinal purposes. This plant leaf shows promise as an inexpensive and sustainable antimalarial therapeutic, especially for use in developing countries.

"We are using western science to validate herbal medicine thereby meshing modern and traditional medicinal concepts."

Community Engagement

WPI's commitment to sustainability is community-wide. Our staff, faculty and students are all engaged in a multitude of sustainability events and groups. In addition to impacting the WPI community, our students and staff are also making an impact on the Worcester community and beyond.

- 2 Sustainability-focused clubs
- 4 Sustainability interns
- 6 Sustainability-related student groups
- 15 Sustainability Advisory Committee members
- 16 Student Sustainability Leaders

Impact

- 100+ herbs and succulents distributed
- 130 nonprofits benefited from student effort
- 3,500 LED light bulbs given away
- 34,890 community service hours
- $169,477 raised to benefit charities
- 185,000+ lbs of food donated

"How Sustainable is WPI?" Panel and discussion

Eco-Rep Program

There were 40 Eco-Reps this year, serving as leaders among their peers and setting examples for sustainable practices. Additionally, in the residence halls, Eco-Reps are encouraged to hold programs promoting WPI's sustainable initiatives, such as single-steam recycling and water conservation.

Sustainability on Campus

Green Team

The Student Green Team holds several events throughout the academic year to raise awareness about sustainability and improve sustainable practices on campus. Some of the major events include:

Waste Audit - The students and staff sorted through trash and recycling from several major buildings and recorded actual and potential recycling rates.

Drive Electric Car Show

This event displayed 33 electric and fuel efficient cars, including an electric bus from the WRTA.

Lighting Fair - This event is co-sponsored by MassSave and National Grid. 706 LED light bulbs were sold to students and staff with potential to save approximately 38,000 kWh annually.

Recyclemania - For several weeks during this nation-wide competition, the Green Team promoted recycling on campus by providing recycling facts and distributing reusable water bottles.

Earth Fest

During the week of Earth Day, the Green Team gave out 20 cacti and over 100 herbs, promoting issues such as water conservation and recipes using local ingredients.

Global Humanitarian Alliance

This group of students promotes humanitarianism on campus and in the local community. This year, the group hosted eight events for their #beAware series, where they informed the WPI community about global issues as well as the importance of sustainability. The group fundraises and donates money to VICMA and Saha Global, and volunteers with the African refugee population by tutoring children at the African Center for Education in Worcester.

Students for a Just and Stable Future

The members of SJSF held a Divest Campaign on campus at the fountain. Vests were hung on trees around this central hub of campus and students were asked to sign in support of the campaign to divest from fossil fuels.

Gordon Library "Food for Fines"

Students donated a total of 753 nonperishable items to the library to be forgiven for $5 of fines per item. The donations went to a variety of locations in Worcester, including the Worcester County Food Bank, Veteran's Shelter, and Abby's House.

WPI Hosts Sustainability Events

Sustainability Series Talks

Every term a speaker was invited to give a presentation on a current sustainability topic.

- *Fusion Power - Smaller and Sooner*, Professor Dennis Whyte
- *Materials for Sustainability*, Professor Diran Apelian
- *Power Generation in Today's Complex World - Alternative Fuel Solutions*, Dr. Jeffrey Goldmeer
- *Land and Water Conservation in a Period of Climate Change,* Wayne Klockner

- **How Sustainable is WPI?** - A panel of WPI faculty and staff informed the WPI community about how they incorporate sustainable practices into their individual departments.
- **Brown Bag Lunches** - Students, faculty and staff gather during the lunch hour to discuss sustainability themed topics including climate change, solar electricity, and food sustainability.
- **CURC Fall Forum on Food Donation & Mattress Recycling** - A gathering for schools in New England to discuss their methods and provide information on best practices.

Sustainability within the Worcester Community

Community Service and Work Study Programs

34,890 community service hours
$169,477 raised to benefit charities

Work on Worcester

225 students participated in this event on October 2, 2015. Students worked together on ecological projects at different sites throughout Worcester, such as raking leaves or clearing brush around Institute Park.

Alumni Earth Day Clean Up

On April 23, 136 WPI students, alumni, faculty and staff worked together to beautify Institute Park, Elm Park, and Newton Hill in Worcester.

Food Recovery Network

This WPI chapter was founded by students Ben Leveillee and Alyssa Konsko as a result of their GPS class, Livable Cities. The group works with their advisor, Bill Baller, a board member for Friendly House to recover food from the campus dining hall and deliver it to shelters around the city. The students have recovered a total of nearly 1800 pounds of food since they implemented their project.

Engineering Ambassadors

This year alone the program has connected with 1300 middle and high school students, covering topics such as wind turbines, food packaging, and oil spills. During the summer of 2015, six of the thirty-six WPI Ambassadors extended their reach to the Worcester community at National Grid's Sustainability Hub where they provided interactive education about new energy technologies, including Worcester's smart grid pilot project.

Food Sustainability Group

Miri Becker, Vinny Sabo and their friends do not officially call themselves a "club," but with the support of Professor Lisa Stoddard, they have been impacting the WPI and Worcester community. They worked with the Regional Environmental Council to grow herbs and other plants for their Youth Grow farm. They also prepared logs for growing shii'take mushrooms over the next year.

Sustainability on a Global Level

Habitat for Humanity

This group helps ReStore Worcester with donations twice a week throughout the school year. Eighteen members of Habitat traveled to Florida to help build homes by insulating, hanging drywall and painting. Project Playhouse was an event where Habitat teamed up with APO and SAE to build a playhouse for a veteran's family and raise money to make critical home repairs for other veterans.

Engineers without Borders

This group has been working in Guachtuq, Guatemala since 2009 to help provide access to clean water. EWB completed the rainwater harvesting system project this academic year, with their seventh and eighth trips. They supplied the community of 220 people with 34 clean water systems, an individual system for each family.

Fishackathon

Combining the most recent technology with the oldest trade of time, computer science students created an app that helps the fishing industry. This 48-hour hackathon was sponsored by the U.S. Department of State and hosted by WPI on Earth Day weekend. The ideas presented by the students focused on making the industry more sustainable by improving and enforcing fishing policies.

"Prior to this event, I was unaware of the complex issues we are facing globally in regards to fishing." -Maryann O'Connell, '17

What's Next in Sustainability?

Among all of the continuing activities of the Office of Sustainability, the following are highlighted for 2016-17:

- In depth analysis of utility (electric, natural gas, water) consumption and opportunities for improvements
- Complete a greenhouse gas management plan
- Develop a transportation plan for reduction of single-occupancy vehicles through promotion of bicycling, use of electric vehicles, ride sharing, and public transportation
- Develop and implement waste minimization programs, and identify targets to increase recycling
- Develop framework for sustainability literacy assessments
- Define and document the sustainability component of students' education and identify methods to include sustainability in the majors

www.facebook.com/sustainabilityWPI @WPIgreen https://www.wpi.edu/offices/sustainability

Acknowledgements

A special thanks goes out to John Orr, Director of Sustainability, and Elizabeth Tomaszewski, Associate Director of Sustainability, for their support and help in writing this year's sustainability report. Additional thanks goes out to all of the staff in Facilities, who have been helpful in so many ways. Lastly, a thanks goes out to each and every student, staff and faculty member that took the time out of their day to answer questions that would be featured in this report.

A message from the author:

"I want to thank everyone who helped me along the way in creating this report. WPI has made so many strides this year, from the launch of Gompei's Gears to the start of the Food Recovery Network to an increase in researchers and courses featuring sustainability. In writing this report, I have learned a lot about sustainable practices and development on a college campus. From evaluating WPI's strengths and weaknesses, I have been able to work with other members of the sustainability team to find ways to improve sustainability on campus in the coming year. It has been a privilege to collect and analyze this information, speak to members of community and have creative liberties in the development process. Thank you all!"

-Nicole Luiz, Mechanical Engineering '18

WPI

wpi.edu/+sustainability
green@wpi.edu