

2011

HPU Campus Sustainability
Report



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Hawai'i Pacific University

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Executive Summary

This report summarizes the many campus sustainability indicators and projects currently underway at Hawai'i Pacific University. It also points to future opportunities to broaden the scope of campus sustainability across the economic, human well-being, and natural environment of both the downtown and Hawai'i Loa campuses. Pointed out, too, are the ways campus sustainability contributes to the many sustainability initiatives in the City and County of Honolulu and the State of Hawai'i. Ultimately, the purpose of this report is to raise awareness within the HPU community of the campus sustainability project, and to encourage greater commitment by the HPU community. Information on the following topics are presented:

1. HPU's current efforts to reduce energy and resource use, including recycling efforts
2. Faculty led initiatives to move sustainability into the curriculum
3. Activities of various organizations, committees, and student groups devoted to campus sustainability
4. Indicators/metrics used to measure energy, water, and other resource use

Background

Sustainability projects have always been a part of Hawai'i Pacific University. In recent years, the hard work and dedication of several student organizations developed paper and HI-5 recycling programs which were managed by the HPU GREEN Club, Filipino Club and Natural Science Student Association. Since then, the issue of sustainability has become a priority to many HPU students, staff, faculty, and the community.

In the fall, 2010, Hawai'i Pacific University took two important steps towards creating a culture of campus sustainability by hiring the first ever Campus Sustainability Coordinator, as well as obtaining membership in AASHE (Association for the Advancement of Sustainability in Higher Education). At the time of this report, the Campus Sustainability Coordinator position has been in place for just over five months. Funding is allocated for a part-time, graduate student position for a maximum of twelve hours per week. The AASHE membership allows HPU to promote its sustainability initiatives to a national audience, as well as acquire information and ideas from other universities around the country. These two steps lay the necessary groundwork for creating a more sustainable campus, and for becoming a model for campus sustainability among universities in Hawaii.

Mission

Through sustainable development practices, Hawai'i Pacific University aims to make positive contributions to the environmental, social, and economic health of the State of Hawai'i and the planet. Implementing sustainability into the culture of our university will encourage the inclusion of sustainability concepts, principles and practices in the curriculum, enhance social justice in the HPU community, improve upon human and environmental health, and ultimately ensure the long-term success of Hawai'i Pacific University.



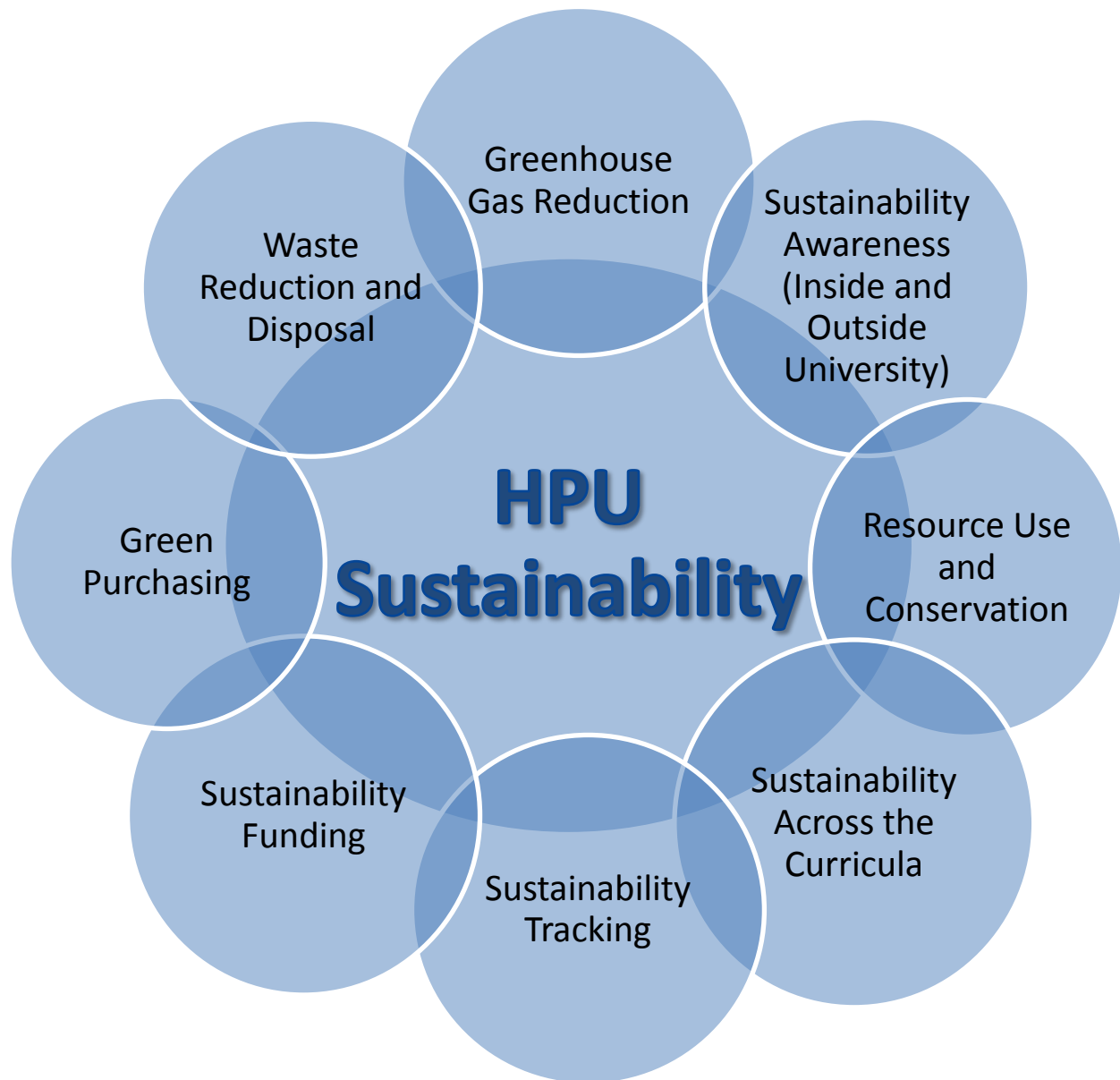
HPU President Chatt Wright alongside HPU students, during a photo shoot for the 2010-2011 HPU Student Handbook.

Principles

Sustainable development is all development that meets the needs of the present without compromising the ability of future generations to meet their own needs. Hawai'i Pacific University should pursue the principles of sustainable development in all academic and operational aspects of the university. The sustainable development principles used to guide the sustainability initiatives of Hawai'i Pacific University include:

- Protect Land and Ecosystems
- Use Resources Wisely and Efficiently
- Use Local Resources
- Limit Waste and Recycle Everything Possible
- Seek Continual Improvement of Environmental Performance
- Seek Continual Improvement of Human Health, Well-Being and Safety Performance
- Uphold Fundamental Human Rights, Respect Cultures, Customs and Values
- Reduce HPU's ecological footprint, including the Reduction of Atmospheric CO₂ levels
- Contribute to Hawaii's Clean Energy Initiative to be 70% free of fossil fuel use by 2030

The model below details the different indicators of campus sustainability that are being interconnected and interrelated; as a system they all play an integral role in bringing about campus sustainability.



The following pages will detail how the Campus Sustainability Coordinator and the HPU community are addressing each of these eight indicators in the model. Continuous improvement opportunities for each indicator are also described.

Waste Reduction and Disposal: *Current Status*

Compost System

A grant proposal (created by Josh Prigge, Tara Zirker, Kimo Carvalho, Linh Do, Lauren Ballou, and Brenda Suazo of the MA/GLSD program) has recently been submitted to the Environmental Protection Agency in an attempt to gain funds for the development of a compost system on the Hawai'i Loa Campus. A compost system would allow the HPU cafeteria to compost a large amount of their food waste, which would decrease the amount of waste from the Loa campus and provide nutrient-rich soil for HPU's organic garden or other areas in need of soil.

Recycling

The expansion and improvement of HPU's recycling programs over recent months will contribute not only to resource conservation, but also to the overall waste reduction of the university. Before cardboard recycling was implemented on the Hawai'i Loa campus, cardboard was a large contributor to trash in the waste disposal bin behind the cafeteria. Also, with the addition of a HI-5 recycling bin on the front lanai, we are decreasing the amount of bottles and cans that contribute to the overall waste on the Hawai'i Loa Campus.

Campus Sustainability Coordinator

With the addition of a Campus Sustainability Coordinator, HPU now has someone who can coordinate large recycling efforts to avoid unnecessary items being discarded as waste. In February, 2011 the Campus Sustainability Coordinator worked with Steven Lum, Shipping/Distribution Manager, and Honolulu Recovery to coordinate a large recycling project, which recycled an estimated 3,200 lbs of old HPU catalogs, envelopes, folders and brochures.

Waste Disposal Tracking

A database has been created to track all waste disposal costs at the Hawai'i Loa Campus. There are currently three dumpsters on the Hawai'i Loa Campus, which are emptied by Honolulu Disposal three times a week while school is in session, and approximately once a week while school is not in session. This database will allow us to track the reductions in waste disposal costs for the Hawai'i Loa Campus while sustainable strategies are implemented. *(See Appendix A for monthly waste removal charges on the Hawai'i Loa Campus)*

Waste Reduction: Opportunities for the Future

- Lower disposal costs by performing waste audits across the Hawai'i Loa and downtown campuses to decrease amount of recycled materials thrown away.
- Further improve and expand campus recycling programs and include military campuses.
- Develop compost system for HPU's cafeteria to decrease food waste.
- Develop a campus-wide waste minimization plan.

Greenhouse Gas Reduction: *Current Status*

Academic Center LEED Assessment

In 2008 Dr. Stephen Allen, HPU professor of chemistry, assessed the Academic Center on the Hawai'i Loa Campus for potential LEED certification, and released a final report in 2009. This assessment came at the recommendation of HPU's 2007 Phase One Planning Report, which recommended: "Build LEED-Silver (or higher) buildings; design buildings that use the characteristics of traditional architecture; build an appropriate renewable energy source on the campus using solar or wind power; complete LEED-Silver renovations to existing buildings; create attractive landscape "Sustainability Gathering Places"."

According to Dr. Allen's report, the Academic Center currently complies with 1 of the 9 prerequisites, and 5 of the 50 credits required for a LEED-Silver certification. It goes on to claim that about half of the prerequisites and credits can be obtained at a relatively low cost. According to the report, it is possible for HPU to obtain the remaining prerequisites and credits needed to achieve LEED-Silver certification.

The most important recommendation of the report was to replace the existing air conditioning system, as it could potentially earn the Academic Center three prerequisites and ten credits towards the LEED-Silver certification. HPU is now preparing to install a brand new HVAC system for the Hawai'i Loa Campus during the fall of 2011. The new system will chill water, and use pipes to send cold water to cool the buildings of the Hawai'i Loa Campus.

Campus Garden and Aquaponics System

The Hawai'i Loa Campus is the home of an organic community garden, as well as a sustainable aquaponics system. The garden was created by the HPU GREEN Club and is maintained by the GREEN Club and Vegetarian Club. The aquaponics system was developed by Dr. Primavera and his students, and is a 100% organic plant growth system which incorporates *Tilapia* fish green water that is relocated via a sump pump to a gravel chip-containing grow beds which allows luxurious plant growth.

Greenhouse Gas Reduction: Opportunities for the Future

- Require new construction and renovations to become Energy Star rated and meet at least LEED silver certification.
- Development of clean energy sources for the Hawai'i Loa Campus (wind and solar).
- Sign the Presidents' Climate Commitment.
- Ride Share program on HPU website to facilitate student and employee car-pools.
- Encourage purchasing of local products and services whenever possible.
- Upgrade campus transit fleet with zero or low-emission vehicles.
- Increase use of videoconferencing in meetings and communications with distant individuals.
- A full-time Director of Campus Sustainability with LEED accreditation will be able to assess campus buildings for LEED certifications.

Sustainability Awareness Inside and Outside the University: *Current Status*

Sustainability Groups

Hawai`i Pacific University currently has an informal Sustainable Campus Committee as well as a number of student organizations that are all actively involved in sustainability initiatives on campus.

- Sustainable Campus Committee
 - Informal group of faculty, staff and students who work together to develop ideas for a more sustainable university.
- University Life and Campus Sustainability Committee of the Faculty Assembly
 - This committee is an official part of the university faculty governance structure and the sustainability coordinator is an ex-officio member. It includes faculty representatives from across the university who contribute to sustainability at HPU.
- The HPU GREEN Club
 - An organization committed to promoting and implementing sustainability initiatives on campus in throughout the community.
- Natural Science Student Association (NSSA)
 - The NSSA is committed to serving the science-related student body at the Hawai`i Loa Campus, and is committed to assisting in the improvement of the sustainability of HPU.
- Vegetarian Club
 - This club promotes vegetarian food, values, and principles, as well as environmental awareness, and helps maintain HPU's organic garden.

University Coalition

A sustainable campus coalition has been developed among universities in Hawai`i to promote a sharing of ideas between universities, and to provide individuals with the resources to further sustainability initiatives on their respective campuses. Josh Prigge arranged the first meeting of this coalition on December 4th at the BYU Hawai`i campus. Sustainability representatives from HPU, UH, Chaminade University, BYU-H, Blue Planet Foundation, Hawai`i Clean Energy Initiative (HCEI) and Kokua Hawai`i Foundation were in attendance.

Sustainability Awareness Inside and Outside the University: *Opportunities for the Future*

- Develop a Farmer's Market at the Hawaii Loa Campus.
- Develop a closed-loop food system for the cafeteria and campus garden which will be used to educate other institutions in the State of Hawai`i and beyond.
- Expand and increase events that are designed to educate the HPU and Hawai`i community on sustainability.
- Recruit highly acclaimed people in the sustainability field to speak, guest lecture, and meet with appropriate groups interested in furthering sustainability at HPU.

Sustainability across HPU Curricula: *Current Status*

Academics

HPU offers many academic programs that are either focused on sustainability, or have important sustainability elements embedded in them. The graduate programs include Global Leadership and Sustainable Development, and the Marine Science programs. The undergraduate programs include Environmental Science, Environmental Studies, and Marine Biology.

(Please see Appendix B for HPU graduate and undergraduate courses related to sustainability)

Sustainability Internships/Workforce Development

HPU has developed a strong relationship with the Hawaii's Department of Business, Economic Development and Tourism (DBEDT) and has provided internships for approximately ten students over the past two years, one of whom is now employed full-time by DBEDT. In addition to this, HPU's Campus Sustainability Coordinator is now taking the lead in sustainability-related internship opportunities at HPU by working closely with the Hawai'i Clean Energy Initiative (HCEI) and Rewarding Internships for Sustainability Employment (RISE) to provide students with valuable work experience that will prepare them for future careers in sustainability.

Sustainability across HPU Curricula: *Opportunities for the Future*

In the future we would like to see the topic of sustainability cutting across all academic curricula at Hawai'i Pacific University. Sustainability involves people of all areas of study, and it is crucial that students, as global citizens, are aware and are fully informed of the importance of this issue. In return, HPU will train a new workforce that implements real global change. Additionally, sustainability will involve adapting to new realities that the State of Hawai'i and the world face. Therefore, it will become necessary to consider the development of new areas of study within the university.

As an initial consideration, due to the State of Hawaii's focus on an agricultural revolution that generates alternative energy sources and food security, we believe some sort of agricultural program at HPU would be an excellent program that trains a new workforce capable of advancing the industry and securing new jobs in the State of Hawai'i, and around the world. There is already an aquaponics system and two gardens at the Hawai'i Loa campus, and with the popularity of farmer's markets and organic food, new programs can be developed to address this growing market. The idea of an integrated, systemic agricultural project of food recycling, food production, and waste recycling, when connected to food services and a farmers market, would serve as a model for learning about sustainability for students.

- Implement concentrations in sustainability where appropriate, at both the graduate and undergraduate levels.
- Build some aspect of sustainability into all curricula.
- Create a new course, Sustainability 101, for general education.
- Implement certificate programs in sustainability, sustainable development where feasible.

Resource Use and Conservation: *Current Status*

Academic Center Lighting Audit

HPU's Campus Sustainability Coordinator began a complete lighting audit of the Academic Center at the Hawai'i Loa campus in April, 2011. This procedure involves measuring the lighting levels at numerous locations in all areas of the building. Once all data is collected, a report will be submitted to recommend the removal of light bulbs that are contributing to lighting measurements above recommended levels. Also included in the report will be recommendations for more energy-efficient light fixtures and ballasts to replace older, more energy-intensive bulbs and ballasts. Removing unneeded lighting and upgrading to more efficient bulbs has great potential to reduce energy and decrease costs throughout the university.

Campus Recycling

Hawai'i Pacific University has developed a number of recycling programs on both the downtown and Hawaii Loa campuses. The Sustainability Coordinator has, since taking the position in November, 2010, expanded these programs, improved their processes, and has assumed the oversight of all campus recycling. (See Appendix C for all HPU Recycling Program information)

HPU Cafeteria

Debbie Day, General Manager of Sodexo, has implemented a number of sustainability initiatives at the HPU cafeteria to conserve energy, water and resource use. These practices include turning off lights and exhaust hoods between meal periods, recycling bottles, cans, cooking oils and grease, using an energy efficient dishwashing system, and using environmentally-friendly packing for the Academic Center building to-go packed lunches. Debbie also includes three themed days each week in the cafeteria to conserve resources and raise awareness including:

1. **Meatless Mondays** – Taking meat out of the dining hall one day reduces our carbon footprint, reduces water use, helps reduce fuel dependence, and lowers cholesterol and risk of heart disease.
2. **Trayless Tuesdays** – Not using trays in the dining hall once a week helps reduce water use and the energy and cleaning supplies needed to clean trays.
3. **Weigh the Waste Wednesdays** – Weighing the amount of food waste from students each week raises awareness among students to become conscience about creating excess waste.

Resource Use and Conservation: *Opportunities for the Future*

- Perform energy audits across HPU campus to reduce energy use and energy costs.
- Reduce water consumption and decrease the use of potable water on the Hawai'i Loa Campus with drip irrigation, rain catchment devices, and waterless urinals.
- Develop a Life Cycle Assessment (LCA) program for HPU's product supply chain.
- Develop strategies for all offices to reduce paper and ink toner use.
- Develop more paperless, electronic processes at HPU such as the paperless CAP reports.

Sustainability Funding: *Current Status*

Grant Funding

Several funding opportunities for sustainability initiatives have been initiated. HPU students have taken initiative to secure outside federal funding through an EPA grant proposal. This proposal (authored by Josh Prigge, Tara Zirker, Kimo Carvalho, Linh Do, Lauren Ballou, and Brenda Suazo of the MA/GLSD program) was submitted on December 22nd, 2010 asking for funds to develop an integrated, net-zero composting/recycling system on the Hawaii Loa campus.

Dr. Art Whatley and Bill Waring (GLSD student) were included in another EPA grant received by the Department of Business, Economic Development and Tourism (DEBDT) that will direct several paid sustainability internships for HPU graduate students. Whatley and Waring will provide training for these interns.

Sustainability Funding: Opportunities for the Future

- Student Fee (Green Fee): \$20 optional fee added to tuition for each student to be used for sustainability initiatives voted on by the students.
- Outside Grants
- Revolving Loan Funds
- Energy Service Company partnerships

Sustainability Tracking/Monitoring: *Current Status*

Sustainability Database

A sustainability database has been created to track and monitor all sustainability initiatives across HPU. The database currently includes a list of all sustainability-related activities across campus, monthly energy and water use for the Hawaii Loa campus, monthly waste removal costs for Hawaii Loa campus, all supplies purchased by department for the past 12 months, and monthly paper and ink cartridge recycling data. This database will help to determine the effectiveness of our sustainability strategies, and determine HPU's strengths and weaknesses in order to develop new strategies and adaptively manage HPU's sustainability program.

Sustainability Tracking: Opportunities for the Future

- Surveys of HPU community's attitude towards sustainability on campus.
- Register for AASHE's Sustainability Tracking Assessment and Rating System (STARS)
- Partnerships with other organizations and Universities in Hawaii.
- Annual report on the state of sustainability at HPU.
- Energy and resource tracking.
- Sustainability initiative tracking across campus.
- 5-year strategic planning session on the future of sustainability at HPU.

Green Purchasing – Goods, Services and Food Products: *Current Status*

Green Purchasing

Sustainability work has started to influence the purchasing of more sustainable or recycled products across HPU. The prices of many green products, which used to be much more expensive, are now becoming more comparable to many traditional products. HPU uses large amounts of paper, operational supplies, fuels, equipment, all of which provide opportunities for green and local purchases.

HPU Cafeteria

In the spring of 2010, Sodexo (dining services for HPU's cafeteria) used produce from HPU's student-run organic garden in the cafeteria. Debbie Day, Sodexo General Manager, has been a proponent of local, sustainable food practices, and has supported the idea of further expansion of the HPU garden to allow for increased produce supply for the cafeteria. For HPU's cafeteria, Sodexo uses 30% local produce, and hopes to increase that number as more local produce becomes available.

Green Purchasing – Goods, Services and Food Products: *Opportunities for the Future*

We would like to see the university use more recycled paper for every day operations across campus, as well as environmentally friendly office supplies and cleaning supplies.

- Require the purchasing of Energy Star appliances whenever available.
- Encourage the use of eco-friendly and low volatile organic compound building materials.
- Encourage the purchasing of environmentally-friendly operational, office and academic supplies whenever possible.
- Encourage increased purchasing of local, organic food products for the cafeteria.

SUSTAINABLE



HPU

APPENDICES

Appendix A
Monthly Waste Removal Charges for Hawai'i Loa Campus

Date	HLC Monthly Waste Removal Charges
Jan-11	\$2,050
Dec-10	\$2,356
Nov-10	\$2,892
Oct-10	\$2,892
Sep-10	\$2,892
Aug-10	\$2,892
Jul-10	\$2,892
Jun-10	\$3,342
May-10	\$3,379
Apr-10	\$2,892
Mar-10	\$2,892
Feb-10	\$2,892

Data collected from Gil Chee (Account Manager) – Oahu Waste

Appendix B

HPU Courses Related to Sustainability

Undergraduate Courses	Graduate Courses
BIOL 3080 Ecology	ENVS 6150 Environment, Power and Society
ENVS 3010 Environmental Impact Analysis	ENVS 6010 Global Climate Change
ENVS 3030 Earth Systems and Global Change	GEOG 4700 Geographic Information Systems
ENVS 4100 Society and Environment: Contemporary Issues Seminar	BIOL 6090 Advanced Biometry
LAW 3300 Environmental Law and Policy	ENVS 620 Advanced Photovoltaic
MARS 4050 Marine Ecology	ENVS 6920 Geographic Information Systems
MGMT 3600 Natural Resource Management	ENVS 6030 Sustainable Energy Systems
PHIL 3651 Environmental Ethics	ENVS 6040 Sustainable Building Systems
SOC 2000 Social Problems and Policy	ENVS 4300 Advanced Photovoltaic Systems Design
ENVS 4000 Methods of Environmental Science	GEOG 6900 Modeling Dynamic Environmental Systems
SOC 3380 Cross-Cultural Relations	GEOG 6990 Modeling Dynamic Environmental Systems
ANTH 3115 Culture Religion and the Environment	GLSD 6000 Sustainable Human Systems
BIOL 1500 Conservation Biology	GLSD 6001 Power and Social Systems
ENVS 4600 Environmental Science Research	GLSD 6005 Research Methods for Environmental Policy and Social Systems
ENVS 2000 Principles of Environmental Science	GLSD 6330 Comparative Management Systems
ECON 3430 Environmental Economics	GLSD 6340 Environmental History of the Modern World
BIOL 3090 Biometry	GLSD 6350 Global Markets in Transition
CHEM 1020 Introduction to Chemistry and the Environment	GLSD 6500 Ecological Economics and Sustainable Development
GEOG 3720 Population Dynamics	PSOC 6441 National Community Change and Development
INTR 3901 Contemporary Nations: International Human Rights	PSOC 6442 Culture and Intervention Strategies
SOC 3560 Community Intervention	
SOC 3650 Global Systems and Development	
SOC 3750 Social Movements and Collective Behavior	

Appendix C *Recycling at HPU*

- **Paper Recycling** – Maintained by the HPU GREEN Club
 - Downtown Campus (7 locations) – Picked up by OCR for Hagadone Printing
 - MP 1st floor (Beretania entrance), FS 1st floor (Computer Center), Sea Warrior Center, BH 3rd floor lanai (Kalamalama), MP Basement, UB outdoors behind garage, and LB basement
 - Hawai'i Loa Campus (2 locations) – Picked up by Honolulu Recovery
 - Outside Student Lounge (next to weight room), Academic Center (behind building on ground floor)
- **Ink Cartridge Recycling** – Picked up by Cartridge World
 - Downtown Campus – Center for Student Life and First-Year Programs
 - Hawai'i Loa Campus – HLC Bookstore
- **HI-5 Bottles and Cans Recycling**
 - Downtown Campus (7 locations) – Maintained by HPU's Filipino Club
 - MP 2nd, 3rd and 4th floor (by elevator), FS 3rd floor (by elevator), Sea Warrior Center, UB 2nd floor by Student Housing office, UB 9th floor by classrooms
 - Hawai'i Loa Campus (9 locations) – Picked up by Honolulu Recovery
 - 1 bin is located on the 2nd floor of each of the six residence halls – Maintained by residence hall advisors
 - Academic Center front lanai, 2nd floor back lanai, and 3rd floor back lanai – Maintained by the Natural Science Student Association
- **Battery Recycling** – Batteries collected and delivered to Interstate Battery Systems of Hawai'i Inc.
 - Downtown and Hawai'i Loa Campus Computer Centers
 - All batteries collected including laptop, cell phone, camera batteries etc.
 - Delivered to Interstate Battery Systems by Campus Sustainability Coordinator
- **Electronic Waste Recycling** – Maintained by Rap Craig (Facilities Coordinator)
 - Collected on the Downtown Campus in back of the Computer Center
 - Recycle all HPU-owned office, audio, video and household electronic items
- **Cardboard Recycling** – Picked up by Honolulu Recovery
 - Collected behind the Hawai'i Loa Campus cafeteria – Maintained by Campus Sustainability Coordinator

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Appendix C continued
Downtown Campus Paper Recycling Metrics for last 8 Months

Month	Pick-up Date	Weight (estimated)
April-10	4/13/2010	1000 lbs
May-10	5/11/2010	750 lbs
June-10	6/1/2010	700 lbs
	6/22/2010	600 lbs
August-10	8/31/2010	950 lbs
September-10	9/14/2010	800 lbs
	9/28/2010	700 lbs
	10/6/2010	800 lbs
October-10	10/12/2010	800 lbs
	10/20/2010	1400 lbs
	10/26/2010	1200 lbs
November-10	11/3/2010	800 lbs
	11/9/2010	450 lbs
	11/17/2010	800 lbs
	11/23/2010	800 lbs
December-10	12/1/2010	1200 lbs
	12/7/2010	600 lbs
	12/21/2010	700 lbs

Data collected from Davide Giardini (Sustainability Coordinator) – Hagadone Printing

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Appendix D Hawai'i Loa Campus Monthly Water and Electricity Use

Date	HLC Monthly Water Usage – Thousand Gallons/Month and Price	HLC Monthly Electricity Usage – Energy Usage KWH and Net Energy Bill
Dec-10	472 and \$1,496.42	192,000 and \$41,973
Nov-10	527 and \$1,670.11	224,400 and \$48,238
Oct-10	653 and \$2,068.01	230,400 and \$49,746
Sep-10	629 and \$1,992.22	189,600 and \$42,545
Aug-10	107 and \$343.75	182,400 and \$40,345
Jul-10	435 and \$1,361.57	180,000 and \$39,529
Jun-10	261 and \$798.48	171,000 and \$37,885
May-10	540 and \$1,646.08	189,600 and \$40,306
Apr-10	584 and \$1,779.75	181,200 and \$38,486
Mar-10	572 and \$1,743.30	196,800 and \$40,805
Feb-10	540 and \$1,646.06	168,000 and \$34,242
Jan-10	268 and \$819.74	148,800 and \$30,639
Dec-09	413 and \$1,260.25	220,800 and \$42,511
Nov-09	691 and \$2,104.82	227,400 and \$44,382
Oct-09	NA	239,400 and \$46,220
Sept-09	NA	216,600 and \$40,793
Aug-09	NA	204,000 and \$34,906
Jul-09	NA	193,200 and \$30,223
Jun-09	NA	178,200 and \$26,712
May-09	NA	191,400 and \$28,543
Apr-09	NA	199,200 and \$29,560
Mar-09	NA	175,800 and \$27,503
Feb-09	NA	165,600 and \$29,274
Jan-09	NA	124,200 and \$26,057

*Data collected from Patti Young (Account Manager) - Hawaiian Electric Company and
Steve Hendricks (Facilities Manager) - HPU Hawai'i Loa Campus*

Appendix E

P3 Awards: A National Student Design Competition for
Sustainability Focusing on People, Prosperity and the Planet; EPA-G2011-P3-Q5

Research Area: Agricultural

Project Title: A Closed-Loop Food System Rooted in Native Hawaiian Culture and Values

Principal Investigator: Dr. Regina Ostergaard-Klem (rosterklem@gmail.com), Co-investigator:
Dr. Art Whatley (awhatley@hpu.edu)

Student Team: Graduate Students - Josh Prigge, Tara Zirker, Kimo Carvalho, Linh Do, Lauren Ballou, Brenda Suazo

Institution: Hawai'i Pacific University

Student Represented Departments and Institutions: College of Natural and Computational Sciences

Project Period: August 15, 2011 through August 14, 2012

Proposed EPA Project Cost: \$15,000

Total Project Amount: Amount requested from EPA \$15,000

Project Summary

Objective: Hawai'i imports 85-90 percent of its food from locations at least 2,500 miles away (Hawai'i Department of Agriculture, 2008). This creates robust challenges in the areas of food security and pollution control. Our proposed project is to create a closed-loop, self-sustaining food system for the cafeteria at Hawai'i Pacific University, incorporating the utilization of aquaculture, hydroponics, a community garden, and a waste-eliminating compost system to bridge contemporary food-sustaining practices with Native Hawaiian cultural values and practices. This will decrease food import dependency, reduce transportation pollution, decrease waste and waste transportation, and create community educational opportunities for other academic institutions while sustaining Native Hawaiian culture.

Design: An interdisciplinary student team will: 1) expand a campus community garden and aquaponics system infrastructure to provide the majority of the food for the campus cafeteria, 2) install a composting system for the cafeteria to decrease waste and provide nutrient rich soil for the garden, 3) integrate Native Hawaiian culture and practices into the food system, and 4) reach out to other academic institutes in Hawai'i to provide the model for implementation of similar closed-loop food systems rooted in Native Hawaiian culture.

Expected Results: Deliverables include: a community garden and aquaponics structure rooted in Native Hawaiian culture with the capacity to supply food demand for the HPU cafeteria, a compost system for all compostable cafeteria food waste, community education on food sustainability rooted in Native Hawaiian culture, and reports for the P3 program on the project accomplishments.

Contribution to Pollution Prevention or Control: As Hawai'i communities reduce food imports, carbon emissions from food transportation are also reduced. Additionally, our project will compost all compostable food waste from the cafeteria, drastically reducing food waste and carbon emissions associated with waste transportation. We hope for this to be a model that other communities and organizations can adopt, thus dramatically reducing the state's overall carbon footprint.