Chapter 6. Purchasing, Waste, and Recycling (Zero Waste)

Our campus has committed to reducing the environmental impacts from the products and services we purchase and discard. These impacts are generated when our vendors produce and extract natural resources, process and transport them to us, and later collect them to be disposed of as waste. Reducing campus purchases, selecting environmentally-preferred products and services, and decreasing waste that ends up in landfills will reduce GHG emissions, improve use of natural resources, educate students about sustainable practices, and contribute to other environmental benefits. Addressing sustainable materials management requires our campus to engage in a "life cycle" approach that considers the energy and other resources used for production and transportation of our purchases, as well as the impacts of wasteful practices such as landfilling a recyclable item.

According to the Zero Waste International Alliance, "Zero Waste means designing and managing products and processes to systematically avoid and eliminate the volume and toxicity of waste and materials, conserve and recover all resources, and not burn or bury them."[40] One approach to measuring campus waste

40) Zero Waste International Alliance, "ZW Definition" http://zwia.org/standards/zw-definition/

includes animal manure, landscape waste, and typical municipal solid waste (MSW) from buildings and exterior waste bins. Applying this definition, in FY14 our total diversion rate from landfill was 85.60%, as shown in Table 6 (right); this rate is dominated by "special recyclables" like animal manure and landscape waste.

Fiscal Year	Annual Total Landfilled (est. #)	Annual Total Commodity Recyclables (est. #)	Annual Total Special Recyclables (est. #)	Annual Total Recyclables (est. #)	Annual Diversion Rate (%)
2008	9,850,035	5,537,877	59,652,270	65,190,147	86.87%
2009	11,860,198	5,601,365	59,714,104	65,315,469	84.63%
2010	12,089,858	4,763,946	59,679,401	64,443,347	84.20%
2011	11,983,068	4,769,674	59,679,836	64,449,510	84.32%
2012	11,770,112	4,476,132	59,682,227	64,158,359	84.50%
2013	11,499,760	4,897,940	59,607,395	64,505,335	84.87%
2014	10,851,940	4,894,320	59,606,882	64,501,202	85.60%

Table 6: Total Diversion Rate from Landfill, FY08 to FY14

In analyzing our operations, however, it is also important to focus on our waste production and recycling of MSW, such as paper, cardboard, plastics, metals, glass, and food scraps. In FY14, the MSW diversion rate from landfill was 31.08%, shown in Table 7 (below).

Since FY08, the campus has taken many actions to move toward Zero Waste. In 2009, we switched from sending landfill waste to a site in Clinton, Illinois (which did not recover methane emissions) to a site in Danville, Illinois (which does recover methane emissions for electricity generation). According to the Campus Carbon Calculator (CCC), this change yielded a substantial benefit in greenhouse gas emissions from the landfilled waste — going from 14,697 metric tons of GHG emissions in FY08 to a negative (saving of) 172 tons of GHG emissions in FY09. For future GHG emission inventories, we will seek to more closely evaluate the emissions impacts from our campus waste stream. With the CCC calculations, our reported emissions declined 101%, even though total landfilled volume increased as much as 23% during the same time, as shown in Table 8 (below).

Fiscal Year	Total Landfilled (est. #)	Total Recyclables Sold (est. #)	MSW Diversion Rate (%)
2008	9,850,035	5,537,877	35.99%
2009	11,860,198	5,601,365	32.08%
2010	12,089,858	4,763,946	28.27%
2011	11,983,068	4,769,674	28.47%
2012	11,770,112	4,476,132	27.55%
2013	11,499,760	4,897,940	29.87%
2014	10,851,940	4,894,320	31.08%

Table 7: Municipal Solid Waste (MSW) Diversion Rate, FY08 to FY14

Among other actions that reduced solid waste, the Housing Department's dining halls now use trayless service, aerobic digesters, and some small-scale vermi-composting to reduce food waste and divert it from landfill. We started participating in the national RecycleMania competition, with Game Day Challenges and e-waste collections. Also, we have implemented innovative programs, such as nitrile glove recycling and reuse of laboratory chemicals. Likewise, we adopted policy statements on zero waste and recycled content of office paper,[41] certified cleaning products,[42] and standards for computers.[43]

While there have been several positive initiatives in this area, a lot more can be done to improve our performance on several measures related to purchasing and waste. Unfortunately, campus policy statements about environmental purchasing standards and preferences are not well-known, used, or enforced. As of FY13, 71% of office paper purchased on campus had no recycled content, purchases of

Fiscal Year	Primary Landfill Location	Landfilled Waste Tons	% Change from FY08	Waste Emissions MT eCO_2	% Change from FY08
2008	Clinton	4,741	n/a	14,697	n/a
2009	Danville	5,746	21%	(172)	-101%
2010	Danville	5,847	23%	(175)	-101%
2011	Danville	5,813	23%	(174)	-101%
2012	Danville	5,700	20%	(171)	-101%
2013	Danville	5,749	21%	(172)	-101%
2014	Danville	5,426	14%	(163)	-101%

Table 8: Waste Tons and Emissions History

41) Campus Administrative Manual, "Recycling, Recycled Products Procurement, and Waste Reduction" (2011) http://cam.illinois.edu/vii/VII-b-9.htm
42) Illinois Green Cleaning Schools Act, 105 ILCS 140/1 (2007) http://ilga.gov/legislation/ilcs/ilcs3.asp?ActID=2903&ChapterID=17
43) Campus Administrative Manual, "Acquisition Policy for Energy-Efficient Equipment" (2011) http://cam.illinois.edu/vii/VII-b-13.htm

office paper decreased only 3.2% from FY11 to FY13, and purchasing practices apply no or weak environmental preferences for vendors or products. According to the U.S. Environmental Protection Agency (EPA), 42% of carbon pollution emissions in the U.S. are associated with the energy used to produce, process, transport, and dispose of the food we eat and the goods we use.[44] Therefore, the campus must strengthen efforts to reduce, reuse and recycle purchased goods, and to select environmentally preferred products and services.

Zero Waste Goals

Going forward, campus should use a comprehensive Zero Waste Program to prevent waste at all stages of the life cycle of products — from reducing both the quantity and the environmental impact of products that we purchase, to encouraging the reuse of materials on campus, to recycling products that have reached the end of their service life. While the existing campus waste management system includes a sorting process to divert recyclables from the landfill waste stream at the campus scale, efforts to increase recycling (both on campus and around the world as students and employees travel throughout their lives) must ultimately rely upon the actions of individuals. Therefore, one of the aspirational goals of the Zero Waste Program is for individuals to take personal responsibility regarding the final destination of their own waste products. This program would apply and report waste-related measurements, establish baselines and accountability by campus unit for purchases and waste, implement training programs, and provide incentives. To raise awareness of waste reduction goals, this program should be communicated clearly to all academic and nonacademic units, employees, and students, including through events and competitions. Life-cycle analysis should be used to identify opportunities for improvement, and enforcement measures should be considered and implemented as appropriate.

Objectives

The comprehensive Zero Waste Program will include sustainable procurement components, targeted reuse programs, clear recycling education with incentives for participation, and specific targets focused on waste minimization. Therefore, the objectives for waste minimization cover all these aspects. They are:

1. By FY17, environmental standards will be applied to purchases of office paper, cleaning products, computers, other electronics, and freight/package delivery services. At least 50% of purchases in these categories will meet campus standards by FY20, and 75% by FY25.
2. Reduce MSW waste going to landfills. This involves reducing nondurable goods purchases, effectively reusing materials, and recycling. In the latter category, campus will increase the diversion rate of MSW to 45% by FY20, 60% by FY25, and 80% by FY35, while also increasing the total diversion rate to 90% by FY20 and 95% by FY25. MSW sent to landfills should decline to 2,000 tons annually by 2035.
3. Utilize landfills with methane capture.
4. Appropriately staff Zero Waste efforts through the hiring of a full-time Zero Waste Coordinator.

Potential Strategies

1. Develop and Apply Environmental Purchasing Standards

Develop Campus Environmental Purchasing Standards

Decisions about the purchasing of many products are handled in a very decentralized fashion on our campus. The University purchasing process ensures that such purchases meet various federal and state

44) U.S. EPA, “Climate Change and Waste” http://epa.gov/climatechange/climate-change-waste/

requirements. However, the process does not effectively apply standards or preferences to select vendors and products having low life-cycle carbon emissions and low embodied energy.

The campus could apply standards for the purchases of certain major categories of products; for example office paper (at least 30% recycled content), cleaning products (Green Seal), computers (EPEAT Silver), other electronics (Energy Star), and freight/package delivery services (EPA SmartWay). Also, the campus could identify environmental standards applicable to additional major categories of purchases. Compliance with these environmental standards should be required, or at least given significant weight, in purchasing decisions. Campus could revise its purchasing systems to curtail purchases of products and services which fail to satisfy selected environmental standards and preferences.

Track Compliance with Campus Standards

The University purchasing process could be enhanced to explicitly track purchases for compliance with campus environmental standards, so that it would be straightforward to measure progress. For example, the process could track the number of computer purchases that are EPEAT Silver and which campus units are falling short in applying this standard.

Utilize Standards from Other Organizations

The campus could also apply sustainable purchasing tools and standards provided by the U.S. General Services Administration, U.S. Department of Energy, U.S. EPA, State of Illinois Central Management Services, and other certifying organizations. It could also utilize and expand purchasing contracts that apply certified environmental standards and preferences, including contracts available for State of Illinois agencies and collectives of universities.

Promote Sustainable Purchasing

The iSEE Certified Green Office Program has been developed to engage campus units and vendors to improve campus sustainability in many areas, including reducing purchases and their associated emissions. This program could be expanded to more units, and could also include more types of sustainable purchasing practices. A similar campaign could also solicit and apply students' suggestions on reducing paper and other products used in classes and buildings. The Office of Business and Financial Services (OBFS) and its purchasing divisions could play a key role in an expanded program promoting sustainable purchasing by adopting goals to reduce purchases and to purchase sustainable products. The campus could also consider applying surcharges to the prices of any noncompliant purchases (through the purchasing system and other mechanisms) to encourage environmentally preferred purchases and recycling.

2. Reduce MSW Landfill Tonnage

Reducing the tonnage of MSW going to landfill will require a combination of reducing purchases, improving reuse of materials that have already been purchased, and increasing recycling rates.

Reducing Nondurable Goods Purchases

The campus could reduce purchases of office paper and computers by encouraging need-based printing and extending the replacement cycles for computers. An initial target could be a reduction of purchases in these categories relative to a FY15 baseline by 15% by FY20 and 30% by FY25. Additional major product categories could be identified for significantly reduced purchases. Purchases could be tracked by campus unit, with training and incentives for reductions; such incentives could potentially be implemented through the Certified Green Office Program.

Reuse Materials

The campus could implement a program to extend the replacement cycles for computers and other electronic products. This would involve educating the campus community about the benefits of postponing the purchase of new equipment, providing incentives for campus units, enhancing options for transferring the equipment to other users on campus, and investigating the potential for transferring equipment to non-campus users, in cooperation with Central Management Services.

The campus could also increase the reuse of materials on campus by expanding its durable-goods cataloguing system. The Surplus department on campus already offers the reuse of various campus property, such as furniture, and campus could increase this program's capacity as well as its visibility and utilization. Campus could work with students to widen and encourage use of surplus goods by all departments.

Raise Recycling Rates across Campus

To increase awareness of waste management, campus could measure the performance by campus units (such as specific building, department and auxiliary) on purchasing, waste, landfill, recycling of specific commodities, and other product reuse. Campus units could be asked to participate in a waste stream characterization study that will help them develop plans to decrease wastes and increase recycling, and conduct training to increase engagement efforts.

Campus could implement incentive programs for waste reduction by campus units and students and raise awareness of waste reduction goals through consistent communications and events, such as more zero-waste sports and cultural events. Finally, campus could increase the sorting of recyclables from combined waste at the waste sorting station.

Increase Availability and Visibility of Recycling Bins

The campus could institute uniform signage for recycling and landfill bins across campus; bins could be strategically placed around campus buildings and grounds to increase visibility of current waste diversion efforts. The number and locations of recycling bins could be increased by pairing them with trash bins. The campus then could reduce the total number of landfill bins. In the ideal case, every landfill bin on campus would be paired with one or more recycling bins.

The campus could also undertake a campaign to increase awareness of special recycling categories, such as glass, food waste, electronics, batteries, and nitrile gloves.

Increase Options for Recycling

The campus could also expand the categories of waste that are recycled on campus. Some examples include expanding the glass recycling initiative, by consulting new vendors for competitive prices, developing new recycling options for plastics types 3-7, and developing expanded polystyrene (Styrofoam) recycling.

Require Recycling of Construction and Demolition Material

Recycling of construction and demolition materials is a component of LEED certification, and is already required by campus for major projects. By extending this requirement to all new construction and renovation projects, the campus could provide further support for LEED building commitments and at the same time make a significant reduction in our waste stream.

3. Methane Capture at Landfill

According to the U.S. EPA, a landfill gas recovery energy project captures "roughly 60 to 90% of the methane emitted from the landfill, depending on system design and effectiveness." Also, carbon dioxide is emitted from electricity generation using landfill gas as well as trucking waste to landfills.[45] Campus could utilize landfills that effectively incorporate methane capture equipment and low-emission trucks.

4. Appropriately Staff Zero Waste Efforts

The strategies outlined here require additional staff time. These Zero Waste efforts would involve coordinating the campus efforts to improve the sustainability of our purchasing practices, to encourage the reuse of materials both on and off campus, and to improve recycling rates for MSW and other types of waste. Zero Waste staff would interface with University Purchasing, Facilities & Services, and units and students across campus.

Conclusion

The campus needs to emphasize waste-related measurements, accountability, incentive programs, communications and systems analysis for campus units and students. Promoting sustainable purchasing practices and reducing waste will not only reduce Scope 3 greenhouse gas emissions on campus, but also has the potential to lower expenditures on purchases, reduce landfill tipping fees, and earn revenue through recycling streams. With a comprehensive Zero Waste Program, enforcement of sustainable procurement standards and expansion of recycling programs, campus would be able to significantly reduce the indirect environmental impacts of its purchasing and disposal practices.

45) U.S. EPA, "Landfill Methane Outreach Program, Basic Information — It directly reduces greenhouse gas emissions" http://www3.epa.gov/lmop/basic-info/index.html