



Iowa State University of Science and Technology Ames, Iowa Waste Reduction

SCHOOL

Iowa State University of Science and Technology, 4 year Public University with 29,887 students enrolled, Ames, Iowa.

ABSTRACT

Iowa State University's Glass Collection and Diversion Initiative is a joint effort between the City of Ames and the University to divert glass from the solid waste stream. Ames has the unique opportunity of incinerating municipal solid waste to generate electricity instead of landfilling through the Ames Resource Recovery Plant (RRP) and Power Plant. Glass in this stream causes damage to and reduces the operational life of Ames RRP and Power Plant processing equipment. In fiscal year 2012 Ames invested \$9,000 in glass diversion equipment and an additional \$2,000 in repairs from glass damage. The program is currently in pilot testing with teaching and research labs at Iowa State University. To further enhance the sustainability of the program, the University is switching to standardized, reusable glass disposal containers, rather than the cardboard ones that are traditionally used. Two types of containers are being piloted; one manufactured by Covidien to collect non-infectious waste sharps, and the other are Purina Tidy Cats litter containers given new life!

GOALS AND OUTCOMES

Goals

Initially the project goal was to divert glass from the solid waste stream to avoid damage to the Ames RRP processing equipment. During data collection it became apparent that there was an opportunity to do much more than simply reroute the waste. Opportunities for more extensive glass waste reduction on campus were discovered through resources already existing, including the Chemistry Glass Shop's redistribution program and ISU Surplus, where excess materials are sold to the public to increase reuse opportunities and recapture funds. No quantifiable targets or goals were set initially because there was no baseline to determine desirable future outcomes. Glass waste production is now being tracked, so future targets for reduction can be set.

Goals for the coming years are to eliminate glass lab waste from the solid waste stream and to increase laboratory compliance with the City's requirements. In addition, we want to better educate lab users about why Ames and ISU have different requirements than other universities and institutions through the use of educational signage and improvements to information available on the departmental websites. A final goal is to decrease the full time equivalent hours spent collecting glass waste by streamlining the process.

Accomplishments and Outcomes

A Glass Collection and Diversion Survey was developed and sent to lab users through their E-Newsletter. The survey focused on what types of glass waste were produced, how labs currently handle excess materials, and what lab users feel would be the most beneficial to improve the program. Most survey

respondents felt that standardized glass disposal containers (83%) and educational signage (53%) would be the best investment to improve glass diversion.

The program is in pilot testing, but is expected to decrease the amount of glass ending up in dumpsters around campus. The Chemistry Department ordered reusable containers by Covidien to test for glass collection in the lab. Ames provided fifty 65 gallon centralized collection containers. Originally a 96 gallon cart for collection was being used, but was determined to be too heavy when full. Ames Lab, a U.S. Department of Energy lab housed on ISU's campus, has requested to be included in the pilot program and is testing the reused Tidy Cats litter containers for glass collection in the lab.

ISU already had a policy of not throwing glass into the dumpster, but it was not followed by all lab personnel. Many working in labs at ISU were previously in other institutions, and most institutions follow the practice of disposing of glass in the dumpster. More effort was needed to educate lab personnel about the different ISU policy. Educational signage has been developed that explains the unique opportunities available in Ames for alternative glass uses and proper disposal methods.

One new policy that came from this project was that ISU's Environmental Health and Safety began collecting all empty chemical bottles to be sorted for hazardous waste contaminants. Rinsing chemical bottles before disposal frequently creates a larger hazardous waste stream. Many lab users rinse all bottles, even if it is not required or beneficial. This waste stream was reduced by bottles being collected and receiving the proper treatment by EH&S. EH&S reuses many of the bottles for waste collection.

This project has had a positive impact by reducing the amount of glass that ends up in the Boone County Landfill, as well as maintaining the equipment at the Ames Resource Recovery Plant and Power Plant. Not only does glass damage the equipment, it also builds up as slag and reduces the heat efficiency. Loss of efficiency means the equipment will use more resources to produce the same amount of electricity. In addition, solid waste from ISU will be reduced because less cardboard will be used for glass disposal on campus.

Challenges and Responses

The largest obstacle to this project was the short timeframe. After initial research began, many unknown issues and areas for potential improvement were discovered. The response to these problems is to continue the project past the expected timeframe.

Campus Climate Action: Your School's Carbon Footprint

Though not having a primarily direct link to global climate change, the Glass Collection and Diversion Initiative offers indirect support in reducing the carbon footprint of Iowa State University. It is very difficult to recycle lab glass because of the use of heat resistant borosilicate glass that cannot be recycled with soda lime glass. Though this project will not reduce the use of virgin materials in production of new lab glass, it does increase reuse options for glass waste reducing virgin material use for other applications and keeping this waste out of the landfill. Keeping the glass out of the incinerators at the Power Plant is essential because it prolongs the life of the equipment and also keeps boiler efficiency high, requiring less input to generate electricity.

Commentary and Reflection

If looking into a similar project, do not be surprised to find out it is more time consuming than originally planned. Be prepared to deal with many other aspects and opportunities, such as not only collecting and diverting waste, but how to reduce it. Remember that for a large research institution focusing on a variety of topics and requiring a diversity of resources and procedures, such as Iowa State University, the system of collecting any type of waste is going to be quite complex. On a more positive note, many little known resources probably exist that can be expanded upon to further improve operations!

ENGAGEMENT AND SUPPORT

Leaders and Supporters

The initiative was sponsored jointly by the Office of Sustainability, Environmental Health and Safety (EH&S), and Facilities Planning and Management (FP&M). Sustainability Director Merry Rankin and FP&M's Manager of Campus Services Les Lawson had discussions with the City of Ames about providing funding assistance. FP&M was open to helping test and arrange new methods of collecting glass waste, as they supervises these activities on campus.

Sean Whalen and Ryan Wyllie at EH&S gave their assistance in coordinating the project and insight into requirements for disposal and safety concerns. Intern Amanda Jacobson was hired to determine best options for alternative containers, design logos and educational signage to assist in informing lab users about the program, and conduct surveys and interviews with labs at ISU and Peer Institutions.

The City of Ames provided containers needed for testing the pilot program. The Chemistry Department was instrumental in helping provide insight into the needs and challenges of campus labs. They also purchased containers to pilot within the department. Ames Lab, a federal laboratory of the U.S. Department of Energy housed at Iowa State University also will be piloting the program.



Funding and Resources

This initiative received funding through the Office of Sustainability, Environmental Health and Safety, Facilities Planning and Management, and the Chemistry Department. The final estimated cost of the initiative, including in-kind support, is \$14,348. The City of Ames provided large glass collection containers into which the individual lab containers could be emptied for an in-kind support of \$4,250. The Chemistry Department provided Covidien non-infectious waste collection containers for their department to pilot at a cost of \$516. A partnership was formed with Nestle Purina, makers of Tidy Cats litter and a donation of 1,056 pails of litter was made to the Raccoon Valley Animal Sanctuary and Reserve with the stipulation that ISU receive the empty containers. If ISU were to purchase these containers directly it would cost \$6,505. Empty Tidy Cats litter containers were also collected through a container drive. Environmental Health and Safety, Facilities Planning and Management, and the Office of Sustainability jointly funded the hiring of an intern. The remaining budget is to provide educational signage as requested by survey respondents.

Education and Community Outreach

The initiative thought it was important to focus on engagement of end users, so a survey was sent out to lab personnel and follow up emails and discussions took place with survey respondents who indicated a

further interest in the program. An article about the initiative was also published in Inside Iowa State, a newsletter for faculty and staff. To improve education of lab personnel, a flow chart showing the process glass waste leaving the labs goes through at ISU was developed. A label for glass collection boxes that shows allowed and prohibited items was also created as part of educational signage.

To engage the wider Ames community in a Tidy Cats container collection drive, social networking and online sites such as Facebook, Craigslist and Freecycle were used in order to inform students and community members of the initiative. Signs were posted at the Ames Area Redemption Center and an appearance was made on a local radio show, Mel in the Morning's Breakfast Club.

CONTACT INFORMATION

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MORE ABOUT YOUR SCHOOL

Campus Sustainability History

Iowa State University's Live Green! Initiative started in 2008, with a Director of Sustainability hired in 2009. The primary focus of the initiative in its beginning was energy efficiency and global climate change. Over the past four years, these areas have continued to be of focus through energy conservation projects, initiatives, and awareness building as well as the diversification of the university's energy portfolio to include and increase renewable sources. In addition focus has been given to infusing sustainability into curriculum, residence life, and campus and community events and volunteerism, as well as engaging faculty and staff in sustainability visioning and strategic planning. To learn more about ISU's sustainability initiative visit www.livegreen.iastate.edu.

Image Credit: Allison Brucker