

The Energy Contest Cover Page
Rutgers New Brunswick Undergraduate Students
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Proposal Title: Rutgers Trash to Treasure Chest

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Abstract

The RU Trash to Treasure Chest Program is designed to help students, the community, and the environment. This project came to fruition at the observation of the amount of waste generated by college students, especially at the end of the semesters. This “trash” is often not garbage at all, but rather items the person no longer needs or uses. RU Trash to Treasure Chest gives students a better alternative for disposing of their unwanted items. The program will collect these items and sell them to students and community residents at a given date. Any leftover items will be donated to a charitable foundation, who will pick up the items themselves. It has been estimated that Rutgers would prevent 53 tons of waste from being landfilled each year.

Based on 53 tons and 2.8 mpg (Inform Inc.), it is estimated that 39.6 gallons of diesel fuel will be saved through eliminating landfill trips. A total of 1.5 million kWh in energy reduction will be realized by implementing this program. This project will save Rutgers money by reducing landfill tipping and hauling fees, minimize greenhouse gas emissions produced by landfilling and transporting waste, increase public awareness about waste minimization and provide the university with a new revenue stream.

Introduction

The purpose of this project is to reduce and reuse the “garbage” coming from the Rutgers’ University Campus, specifically at the end of semesters. Rutgers houses thousands of students who move into and out of dorms every year. At the end of each semester students throw away objects that could be useful to other students or even people within the community. Student throw away things such as unwanted clothes, shoes, school supplies, posters, furniture, electronics, and many other items. While these items may be trash to some students, others might find some of these items quite useful for future semesters. Furthermore, the U.S. EPA (2012) has estimated that in 2009, 117.5 Tg CO₂ equivalent is emitted annually due to landfilling in the U.S.

This number needs to be reduced in order to minimize further global warming contributions.

The RU Trash to Treasure Chest project involves the collection of these unwanted items that take up space in landfills. During move in/move out days at the school, special bins/receptacles will be placed by the dorms allowing students to place unwanted items in the bins instead of putting them in the trash. These items will be collected and sold. Designated bins will also be around throughout the school year for students to place smaller objects in (ie: clothes, school supplies, etc.). There will also be a number students can call to arrange a pickup for bigger items that cannot be placed in the bins (furniture) during the school year. All of these items will be taken by volunteers to a designated storage center located on the New Brunswick Campus. Items will be sorted and stored here until the beginning of each semester, when there will be a campus-wide “yard sale”. Any items remaining after the sale will be sent to a charitable foundation.

This project helps students find cheaper dorm room and college essentials, and helps the foundation receiving the goods, all while helping the environment by decreasing the amount of waste sent to landfills.

Waste Management

The Local and Global Concerns of Excessive Landfilling include greenhouse gas emission, disease vectors, space management, and the not in my backyard concept i.e., no one wants a landfill in their neighborhood. Excessive landfilling creates a number of problems.

Landfills take up important space that could be used for homes, farms, schools, businesses, hospitals, or simply kept as wilderness for the good of the animals. Precipitation which falls on landfills seeps through the garbage, forming a polluted leachate that penetrates into the groundwater. This can lead to problems with drinking water and the need to take extra steps to purify the pollution. Also, landfills are essentially modernized dumps, so most people would prefer to not live around them. Every single ton of waste that is recycled is one less ton sent to the landfills. Recycling is the answer to the problem of excessive landfilling.

Research

Penn State T2T Program has been in operation since 2002. They avoid almost \$5,000 annually in landfill tipping and hauling fees, save over \$14,000 annually in labor fees, prevent the landfilling of over 68 tons annually and generate \$50,000 annually in revenue. Each year, Penn State averages 190 tons in move-out waste. This represents the largest two-day waste stream produced at the Penn State's University Park (main) Campus. As a result of the T2T Program, Penn State recycles 42% of this move-out waste annually.

Yale has a similar Trash to Treasure Program. They prevent over 45 tons of student produced waste from going to the landfills each year. In their program, they collect the unwanted student items from the curb and then store them in a designated place on campus. Then at the beginning of the next semester, the items are resold at a giant "Campus Yard Sale". This helps students by giving them essential items for their dorms or houses at a cheaper price via the campus yard sale. It helps the environment by dramatically cutting down the student waste sent to landfills.

Plan

Penn State's Trash to Treasure Program will be used as a paradigm for the Rutgers Trash to Treasure Chest Program for the following reasons: Penn State and Rutgers are both located in the northeast section of the United States. They are both institutions of higher learning with a student populous of comparable size and demographic. Therefore, it is safe to assume similar results from similar programs. Penn State has a student body of 44,000 students on the University Park Campus and recovers on average, 68 tons of waste per year over a 10 year period (PSU T2T Program). Based on this information, Rutgers will reduce landfill waste by 53 tons every year (based on a Rutgers New Brunswick student population of 34,000 students).

Items to be collected include but are not limited to: clothing, electronics (computers, TV's, stereos, etc.), furniture, bedding (sheets, pillows, blankets, etc.), shoes, carpets, toys and athletic gear. Based on these numbers and a waste characterization estimation, approximately 1.5 million kWh of energy will be reduced upon implementation of this program (fig. 1).

In order for the Trash to Treasure Chest Program to be successful at Rutgers, student volunteers are key. Volunteers for the program will help spread word about the program, they will set up the collection bins in each University housing building at the end of the semesters, and they will help sort the items once they are collected. Also, at the end of each semester, large item bins will be placed in the common areas between residential buildings. Once students are moved out, University trucks and volunteers will pick up the bins and take them to the designated storage area. Here, the items will be sorted and stored until the beginning of the next semester. At the beginning of the next semester, there will be a designated day when students and local community members can come and find their awaiting treasures. The fee to get into the “treasure chest” will be one dollar per person. There will also be a early bird special, where people can get in before the general crowd for an admission fee of five dollars. Anything that is left over after the program day will be donated to a 501.3.C charitable organization.

Fig. 1 Energy Consumption for Production of Products

Component	Percent of Total	Tons	Energy per Ton (kWh)	Total Energy (kWh)
Clothing	15	7.95	80,000	636000
Bedding	10	5.3	80,000	424000
Computers	10	5.3	13,000	68900
TV's	20	10.6	13,000	137800
Rugs	20	10.6	2,600	27560
Furniture	25	13.25	15,000	198750
		53		1493010

Budget

The start of this program will be where most of the costs are incurred. The main costs for this program will be getting bins. After the bins are purchased, they will be re-used every year for the program. The program will be run mainly by volunteers. Besides the small initial costs for the bins, the only other costs include having the bins transferred from their locations to the storage center and advertising for the program. After this program gets underway, it will eventually pay for itself, generate revenue to put back into Sustainable Rutgers, and prevent the landfilling of 53 tons of waste per year.

Conclusion

Waste management and resource conservation are topics of extreme importance in the sustainability of life on earth. This report clearly illustrates that it is possible to prevent a substantial amount of waste from being landfilled at the Rutgers New Brunswick Campus. This program will reduce energy consumption, it is economically feasible, environmentally sustainable and will bring a valuable asset to the citizens of the Rutgers community in many respects. The research indicates that funds are currently available, regardless of the condition of the economy. We believe that this plan will improve the quality of life for current and future populations of the Rutgers community and serve as a much needed catalyst to inspire others to take control of their own waste and resources. With your help Ms. Birrer, this proposal can and will become a reality.

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