XXV Congresso de Iniciação Científica da Unicamp
October 18 to 20 Campinas | Brazil
2017

"Implementation of Waste Prevention Policies at the School of Civil Engineering, Architeture and Urban Design" ("A Caracterização de Resíduo Sólido e a Implantação de Políticas de Prevenção - Estudo de Caso: FEC/UNICAP").

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Abstract

Considering the continuous increase of waste generation, waste prevention appears as a pro-environmental alternative to decrease the amount of waste landfilled, contributing to the mitigation of environmental impacts. To guarantee the efficiency of a prevention program, it is indispensable to have a detailed characterization, which will provide the data for the implementation analysis. Thus, in this project, the waste generated at the FEC/UNICAMP was characterized and separated into the following categories: paper (58.76%), organic (29.69%), plastic (8.77%), mixed (1.94%) and aluminium (0.84%). Based on the composition analysis, waste prevention measures were proposed, as well as a new collection system.

Key words:

waste characterization, waste prevention, waste management

Introduction

Nowadays, the debate about the increasing waste generation is gaining relevance at the academy and public and private sectors. According to the OECD (2000), the quantity of waste generated in big urban centers will almost duplicate in the next 20 years, causing direct and indirect impacts at the population and ecosystems. Thus, the waste prevention appears as one pro-environmental alternative that offers an important potential to decrease the amount of waste landfilled, contributing to the mitigation of environmental impacts. Furthermore, to guarantee the efficiency of a prevention program, it is indispensable a detailed waste characterization, which provides the data for the implementation analysis.

Results and Discussion

The characterization consisted in collecting, separation and weighting the waste samples. Hence, 13.9 kg of waste were collected and separated into categories as it is illustrated in the graph bellow (Image 1).

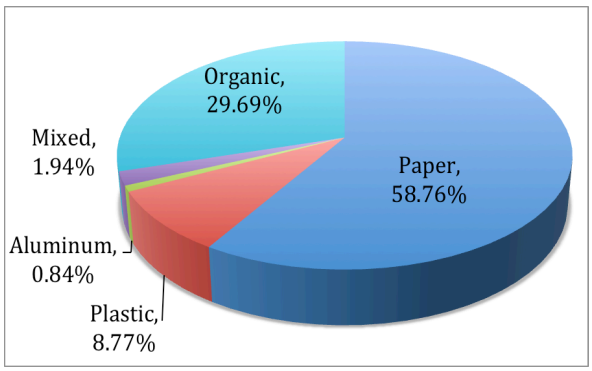

Image 1. Partial distribution of the collected waste in function of the type of material.

After analyzing the data, the following materials were identified as key sources to prevent due to their high generation and the possibility to deal with them in an efficient and sustainable way: paper towel, white paper, plastic cup and plastic bottle. It is estimated that more than one ton of paper towel, almost one ton of white paper and almost half ton of plastic are discarded annually at FEC/UNICAMP. Due to the obsolescence of the actual collection system and the low participation of the students and employees, the source separation is almost nonexistent and most of the waste is delivered to landfills.

The substitution of paper towels and the old collection system restructure were proposed as the main prevention actions. In case of paper towels, according to Montalbo, T., Gregory, J. and Kirchain, R. (2011), hand dryers are the most efficient alternative with less impact. To choose the most suitable appliance, a list of available hand dryers in accordance with pro-environmental requirements were submitted to FEC/UNICAMP administration board. The new collection system was divided in three main categories: recyclable, organic and toilet waste. To increase source segregation efficiency, three types of bins were designed considering the waste category and available waste treatment: one for plastic bottles and aluminum cans, one for organic waste, one for recyclable office paper. Strategically, bins for refuse waste were decrease at maximum, leaving only one in each floor. The new system was also designed with user friendly and intuitive signals/messages to increase public engagement and to minimize discard mistakes.

Conclusion

Based on the solutions proposed, it is expected a considerable efficiency improvement in the waste management system at FEC/UNICAMP. For even better results, incentives must be considered since they may increase the community's engagement. Strategic communication must be included as lectures, workshops, posters and campaigns to alert students and employees about the environmental impacts of fast consumption and to motivate reusing and the responsible use of resources. Moreover, it is fundamental to substitute disposable plastic cups by durable options and also the development of paper free administrative process, such as virtual signatures and online procedures.

Vancini F. Strategic Waste Prevention–Reference Manual of the Organisation for Economic Co-operation and Development (OECD). Paris, France. 2000.

Montalbo T, Gregory J, Kirchain R. Life cycle assessment of hand drying systems. Massachusetts Institute of Technology. 2011 Sep 19;113.