

A Triple-Bottom Line Investigation into the feasibility of the integration of the Eco-To-Go program in the new Student Union Building

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APSC 262

April 04, 2013

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APSC 262: Technology and Society II
Sustainability Project Report

A Triple-Bottom Line Investigation into the feasibility of the
integration of the Eco-To-Go program in the new Student Union
Building

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April 4, 2013

ABSTRACT

The following report outlines whether the new Student Union Building (SUB) that is being built on UBC's Point Grey campus, should offer a program that allows students and faculty members to receive a reusable container which they can use to store their food products. This program is called the Eco-To-Go program and it has already been adopted by many other institutions for providing people with a sustainable way of storing their food when traveling from place to place. Whether the new SUB should also adopt this program is approached with the use of a triple bottom line assessment.

The triple bottom line assessment consists of assessments regarding the social, economical and environmental impact of new SUB's use of this program. The Research for these topics were gathered through websites, government documents, academic papers and feedback from institutions that have used the Eco-To-Go program in the past. The social impact is on the students and faculty members who would make use of this program. It looks at the number of people that will be projected to make use of this program from the results of anonymous surveys. On average 35% of people on the survey showed interest on using this program. The economical assessment regarded the AMS run businesses and the cost of purchasing, distribution and cleaning these containers which fell to within the budget of using disposable containers which the AMS currently uses. The environmental assessment prefers the use of reusable containers against the disposable containers that is currently used in the SUB to reduce waste generated and to move forward with UBC's sustainability plans.

In conclusion, based on the points that are outline above, it is advantageous for the new SUB to incorporate the Eco-To-Go program to the students and faculty members of UBC.

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GLOSSARY

Bisphenol A (BPA)	An organic compound that is used in the manufacture of certain plastics. It is also harmful to the environment
Polypropylene	a thermoplastic polymer used in a wide variety of applications including packaging and labeling, and textiles
Sustainability	the potential for long-term maintenance of well being, which has social, economic, and environmental dimensions.

LIST OF ABBREVIATIONS

AMS	Alma Mater Society
BPA	Bisphenol A
SUB	Student Union Building
UBC	The University of British Columbia
CIRS	Centre for Interactive Research on Sustainability
PP	Polypropylene

1.0 INTRODUCTION

The new Student Union Building (SUB) is scheduled to open during the 2014 winter school year. The AMS run food services in current SUB make use of disposable containers which fill up the majority of the compost bin, and when they overflow, people have no choice but to put them in the garbage. The Eco-To-Go program would allow students and faculty members to receive a keycard or make use of their UBC card to sign out a reusable container that they can use to conveniently store their food products and also carry around with them when traveling between various places on campus. When finished the individual would return the container and get it recorded on their keycard or UBC card that it has been returned.

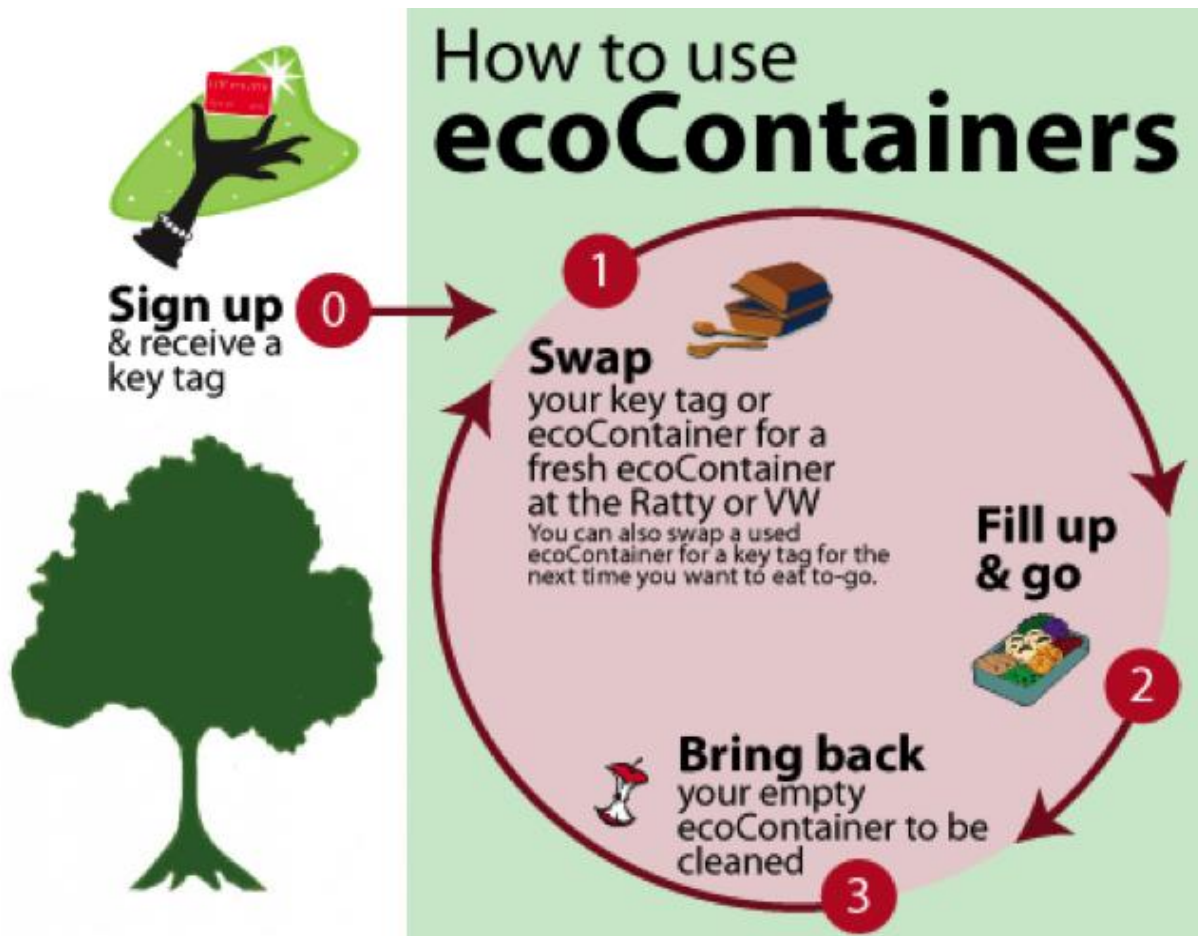


Figure 1 – Lifecycle of the Eco-To-Go program

http://www.brown.edu/Student_Services/Food_Services/eateries/togo.php

The remainder of this report will be using a triple bottom line assessment for the social, economical and environmental impact of this program. The social aspect would cover the predicted percentage of people that would make regular use of this program and whether it will make a positive impact on their daily activities on campus. The economic assessment will compare the budget of using this program against the AMS Food Service's current budget on disposable containers. It will also consider the use of a centralized or decentralized location for returning the containers. Environmentally, this report assesses on leaving a smaller global footprint with reusable containers, rather than current SUB's use of only disposable containers. This covers the triple bottom line assessment of whether the Eco-To-Go program should be adopted by the new SUB and that it can improve UBC's overall sustainability factor.

2.0 SOCIAL ASSESSMENT

For the social aspect of the triple bottom line assessment, this report focuses on the impact that the Eco-To-Go program will have on the individuals that will make use of the program. The users will comprise of students and faculty members of UBC. There will be people who live on campus and others that commute everyday. These are the two groups that are the target user base for this program. On UBC's large campus, there are many different food services and a vast number of people who purchase food products on campus and also bring their own items from home. The program will have to cover the needs of people using the containers for storing their own prepared foods and for purchased food from different campus food services.

2.1 RESULTS OF SURVEY

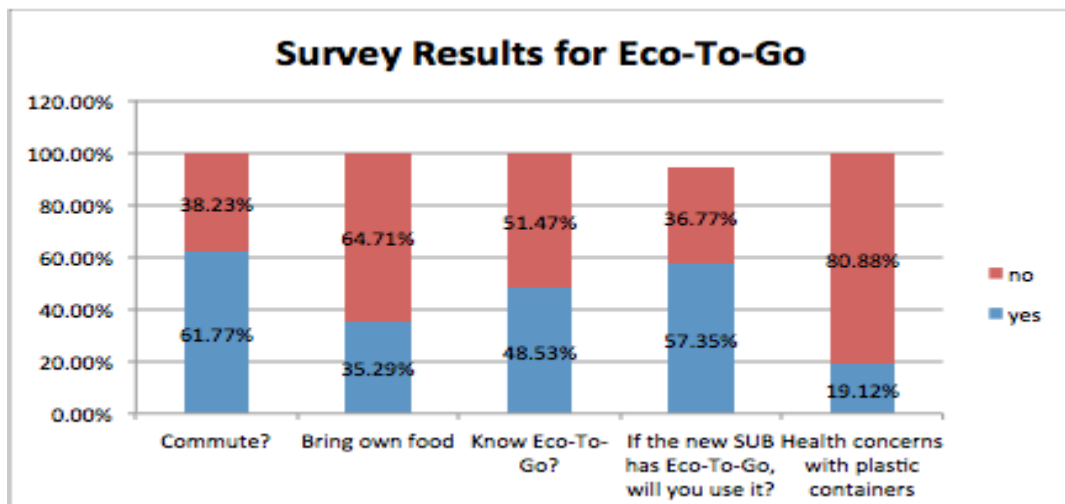


Figure 2, Survey Results for Eco-To-Go Program

A total of 68 students around campus were surveyed. These 68 students comprise of students from the APSC 262 tutorial class, second year electrical engineering classes, and random individuals from UBC village. 52.9% of them are not familiar with the Eco-To-Go Program, and there are 8 students used Eco-To-Go Program before. 57.3% of the students

showed that they would use the Eco-To-Go Program from the new SUB. 36.8% (25 students) expressed no interest in Eco-To-Go Program. Out of those 25 students, 11 of them said they have health concern and hygienic problems with plastic food container, such as BPA and other toxins plastic may contain. Some of them “do not feel like sharing the same utensils with other students”. The other portion of this group indicates that they would bring their own food to campus, which is more convenient and time-saving.

2.2 DATA ANALYSIS

According to the graph above, the majority of UBC students commute everyday, and about 65% of the students do not bring their own food. They purchase their meals in the SUB and other cafeterias around campus. This 65% of the students constitute a huge portion of UBC community, therefore if those students use Eco-To-Go containers, that would be a significant amount of reduction in waste product. More than half of the students from the survey (57.3%) showed their interest in the Eco-To-Go Program in new SUB, which proves its feasibility. However, due to some health and hygienic issues, there is still a significant group of students are not comfortable with the Eco-To-Go Program. Some students worried about whether the container is BPA free. The Eco-To-Go containers are manufactured by Starfrit; they are made from polypropylene and are BPA free. These containers are also easy to clean and can resist the temperature from -30 °C and -125 °C (<http://www.publicaffairs.ubc.ca/services-for-media/ubc-facts-figures/>, accessed on April 2, 2013). The purpose of the Eco-To-Go Program at UBC is to reduce the waste product from disposable containers and to attract more students to use it. Therefore, if the new SUB adopts Eco-To-Go Program, then they need to advertise the advantage of such program and eliminate students' concerns. For example, emphasize the point of BPA and free will probably attract more students to use Eco-To-Go containers. More importantly, the new SUB has the responsibility to ensure the health and safety of the food containers.

3.0 ECONOMIC ASSESSMENT

The main economic assessment of the new SUB including the Eco-To-Go program will consist of assessing the previous instances of where the program was adopted and the budget of the current SUB for the AMS Food Services. This assessment will look at the current and the future budgeting of the new SUB including the Eco-To-Go program and the costs for buying, distributing, collecting and washing the reusable containers. In the long run, this assessment will estimate, with the added cost of the containers and when the new SUB will start to make back the cost setting up this program. Since the program is currently being used at UBC's Vanier Place Residence and Totem Park Residence, a portion of this assessment focus on the program at Vanier and the results of what worked well and what did not work as well that can be improved upon for the program at the new SUB.

3.1 ECO-TO-GO PROGRAM AT VANIER AND TOTEM

The Eco-To-Go program was introduced to some of UBC's Residences starting in fall 2011 and is still currently in use by the residents. Totem Park and Vanier Place are two of the residences that are currently using the program and this portion of the Economic assessment will focus on the system that they use for this program. Currently, there are approximately 4000 participants of the Eco-To-Go program at these residences. Eco-To-Go is currently only distributed from the cafeterias in Totem and Vanier. It can, however, be integrated at all food outlets (Chan, 2013). The cost of a student to sign up for the program is \$5.00 for the school year. UBC is able to purchase the containers for \$2.50 a box. At half the price for buying the containers, already the program appears to be profitable at a first glance. The manufacturer of these containers is Starfrit. The containers were chosen for: being leak proof (type of seal), to be able to withstand industrial washers, and could contain the largest menu item for UBC Food services which are burger and fries. Most containers are still in the system even after the program has been running for two years (Chan, 2013). The cleaning of these containers is done through industrial washers.

3.2 BUDGET FOR ECO-TO-GO IN THE NEW SUB

The Eco-To-Go program for the new SUB is expected to be very similar to the program that is currently used in Vanier and Totem Residences. Since the manufacturer Starfrit is currently allowing UBC to purchase containers at \$2.50 per container, a new deal with other manufacturers not a desirable choice for UBC and the new SUB will also use the same containers used in the residences (Chan, 2013). The participants of the program at the new SUB should also be charged \$5 to sign up for the program as it is already twice the amount that UBC has to pay to purchase these containers from Starfrit. As there is approximately 4000 students (most of which live on campus at Vanier and Totem Residences), it is estimated, from the results of surveys shown in *Figure 2* and considering that Walter Gage Residence is very close to the location of the new Sub; there is an estimated 1000 people that can potentially sign up for this program. For the cost of cleaning the containers, Vanier and Totem used a variety of Industrial washers to clean the containers (Atkinson, 2013). The budget does not have to consider the cost of the washers as they have already been ordered by UBC for when the new SUB opens. For the specific location for students to return the containers, a centralized location at the new SUB is recommended as having several decentralized locations on parts of the campus will increase the costs of the program to an unfeasible range. For management, Managers of each cafeteria keep track of container inventory; if there are more needed UBC Food Services can facilitate the temporary transfer.

3.3 LONG TERM IMPACTS

As the costs of the program at the new SUB currently stands, its budget is almost identical to the program currently used in Vanier and Totem Residences. They currently stand at a cost of \$2.50 for each container that UBC purchases from the manufacturer Starfrit, ~1000 commuter and non-commuter students predicted to make use of this program with a \$5 cost for signing up for the program. As an economic assessment, a primary focus on when the new SUB will “break even” on the initial cost of starting up this program. In the first year of this program UBC will have to purchase approximately 1000 containers at a cost of \$2.50 per container being

a fixed cost of \$2500. At a selling price of \$5.00 to sign up. Break Even Analysis is used to determine when the program will become stable and profitable (Carney, 1998).

From Break Even Analysis:

$$\text{Break Point} = \text{Total Fixed Costs}/(\text{Unit Sale Price} - \text{Unit Variable Cost})$$

$$\text{Break Point} = (2500/(5-2.5)) = 1000 \text{ units}$$

The Breaking point would be 1000 units or 1000 people signing up for the program. However, with the current containers that are being used at the residences, most are still in the system after two years. Because of this, UBC does not have to purchase as many containers in the next year of the program. Assuming that ~1000 students sign up for the program in its first year, the program would become profitable starting in its second year. Economically, the inclusion of the Eco-To-Go program in the new SUB would provide UBC with a sustainable container exchange program that will be profitable after its first year.

4.0 ENVIRONMENTAL ASSESSMENT

UBC as a university and community is striving to become greener and more environmentally friendly, with its aim of greenhouse gas reduction of 33% by 2015, 67% by 2020 and 100% by 2050. Sustainability projects and actions have helped UBC reduce its carbon footprint over the years, and the Centre for Interactive Research on Sustainability (CIRS) is a prime example, where it is arguably deemed the most environmentally sustainable building in all of North America. There is no doubt that the new SUB will also strive to replicate the CIRS to become one of the greenest buildings on campus, displaying UBC's drive to a greener campus.

The environmental assessment of the Eco-To-Go program for the new Student Union Building will mainly focus around the environmental implications of plastic containers. This involves assessing the use of the containers as well as disposal of them, which includes normal use, lifespan, cleaning, and so forth. Disposable containers will also be briefly assessed.

4.1 CONTAINER USE

UBC's current SUB is the central place for the 50,000 students and staff to eat during lunch hours of any day. Assuming that 9 out of 10 of all these people comprise of ones that bring their own food or do not eat there at least once every day, five thousand people eat at the SUB everyday. Each food outlet in the SUB serve food in disposable (and supposedly compostable) containers, which approximates to 5000 waste containers generated everyday and approximately 100,000 waste containers every month to according to our assumption.

The Eco-To-Go program was introduced in 2011 in Totem and Vanier residences on campus to decrease the use of disposable containers for people who wanted take out. According to Vicki Wakefield, the purchasing manager for Food Services, the use of disposable containers have decreased by 20% ever since the start of the Eco-To-Go program. Applying this to the original assumption of 100,000 waste containers every month at the current SUB, 20% decrease equates to 20,000 disposable containers saved every month. In addition, saving 20,000

disposable containers does not merely save the environment of having to decompose them, but also saves resources to manufacture the containers, money for the purchase, fuel for transport, as well as pollution for the entire process. Although the percentage is not extremely high, the assumed numbers are significant. Should this program be mandatory for every to-go food purchase in the new SUB, the reduction in the environmental impacts of disposable food containers can be significant.

The use of reusable plastic containers at the new SUB will definitely reduce the dependence on disposable containers to serve food. Although such a program will reduce disposable containers waste, the implication is that each reusable container will need to be washed and cleaned in UBC's industrial washers currently equipped at every food outlet, using electricity, water, as well as washing detergent. These things will inevitably have an adverse impact on the environment, especially water pollution.

4.2 SUSTAINABILITY AND RECYCLABILITY

Plastic containers used in UBC's Eco-To-Go program currently implemented at Totem and Vanier residences are Type 5 Polypropylene plastic 350ml Lock&Lock container boxes manufactured by Starfrit. Some plastics contain BPA, a organic compound used in the manufacturing process of certain plastics that is harmful to both the environment and humans. Starfrit's plastic food container boxes are all BPA-free and thus eliminating the possibility of this compound leaking into the environment. A figure of the different plastic types and their

properties is shown below.









Plastic Identification Code	Type of plastic polymer	Properties	Common Packaging Applications
	Polyethylene Terephthalate (PET, PETE)	Clarity, strength, toughness, barrier to gas and moisture.	Soft drink, water and salad dressing bottles; peanut butter and jam jars
	High Density Polyethylene (HDPE)	Stiffness, strength, toughness, resistance to moisture, permeability to gas	Milk, juice and water bottles; trash and retail bags.
	Polyvinyl Chloride (V)	Versatility, clarity, ease of blending, strength, toughness	Juice bottles; cling films; PVC piping
	Low Density Polyethylene (LDPE)	Ease of processing, strength, toughness, flexibility, ease of sealing, barrier to moisture.	Frozen food bags; squeezable bottles, e.g. honey, mustard; cling films; flexible container lids.
	Low Density Polyethylene (LDPE)	Ease of processing, strength, toughness, flexibility, ease of sealing, barrier to moisture.	Frozen food bags; squeezable bottles, e.g. honey, mustard; cling films; flexible container lids.
	Polypropylene (PP)	Strength, toughness, resistance to heat, chemicals, grease and oil, versatile, barrier to moisture	Reusable microwaveable ware; kitchenware; yogurt containers; margarine tubs; microwaveable disposable take-away containers; disposable cups and plates.
	Polystyrene (PS)	Versatility, clarity, easily formed	Egg cartons; packing peanuts; "Styrofoam"; disposable cups, plates, trays and cutlery; disposable take-away containers;
	Other (often polycarbonate or ABS)	Dependent on polymers or combination of polymers	Beverage bottles; baby milk bottles; electronic casing.

Figure 3: Plastic types and their properties

<http://www.gogreenwaterfilter.com/plasticcodes.jpg>

As seen in the above figure, polypropylene is used for its strength, heat and chemical resistance, making it favourable in the manufacture of reusable food containers. As a result, the expected lifespan of polypropylene containers can range from 2 to 10 years depending on level of use, contrasting with the disposable container's lifespan of only one use. This makes reusable containers a very viable option, since every use of it will mean one less disposable container used.

Plastic containers in the Eco-To-Go program will be subject to wear and tear over time, and eventually damaged to the point where it can no longer be used. Fortunately, unlike disposable food containers, polypropylene is recyclable. Polypropylene can be recycled into other plastic products, such as brushes and trays. Therefore at the end of the reusable plastic containers' lifespan, it does not need to end up in a landfill or subject to a composting process, which will take space and energy over time.

Based on the findings discussed above, there are certain advantages that a reusable container program will have over the current use of disposable containers. The new SUB will benefit the environment greatly by drastically reducing the waste generated from disposable

containers every day. Despite the plastic container’s implication of requiring water and electricity to wash and clean, its shortcomings are small compared to the sustainability it provides in the long run. Below is a table that summarises the comparisons between reusable plastic containers and disposable containers.

Property	Reusable Plastic Containers	Disposable Containers
Transport required	Low	High
Water use	High	None
Electricity use	High	None
Ease of disposal/recycle	High	Low
Lifespan	High	Low
Sustainability	High	Low
Environmental Impact	Low	High

Figure 4: Summary of comparisons between reusable plastic containers and disposable containers

CONCLUSIONS AND RECOMMENDATIONS

As for a final conclusion and recommendations, it will be very beneficial for the new SUB to include the Eco-To-Go program. In terms of social aspect, although there are a few individuals expressed their concerns with the food containers, the majority of UBC students showed their interest towards Eco-To-Go program, which proves the feasibility of this program. If the new SUB uses Eco-To-Go, they need to make sure the containers are washed thoroughly after use, so the students will have safe and healthy food. For the economic analysis of the triple bottom line assessment, the Eco-To-Go program at UBC's residences were analyzed and a basic cost estimation was used to determine when the program would become profitable, based on the number of people that is estimated to use the program. The assessment showed that the program would become profitable after its starting year. The environmental assessments show that the Eco-To-Go program would be of benefit to the new SUB in decreasing its environmental impact. The introduction of the program saw a 20% decrease of disposable container user in Totem and Vanier residences, and the same can be projected for the new SUB. The lifespan of up to 10 years of reusable containers also make it feasible for long term sustainability. Overall it is a beneficial program for both the students and the UBC.

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