

1.1 Contact Information

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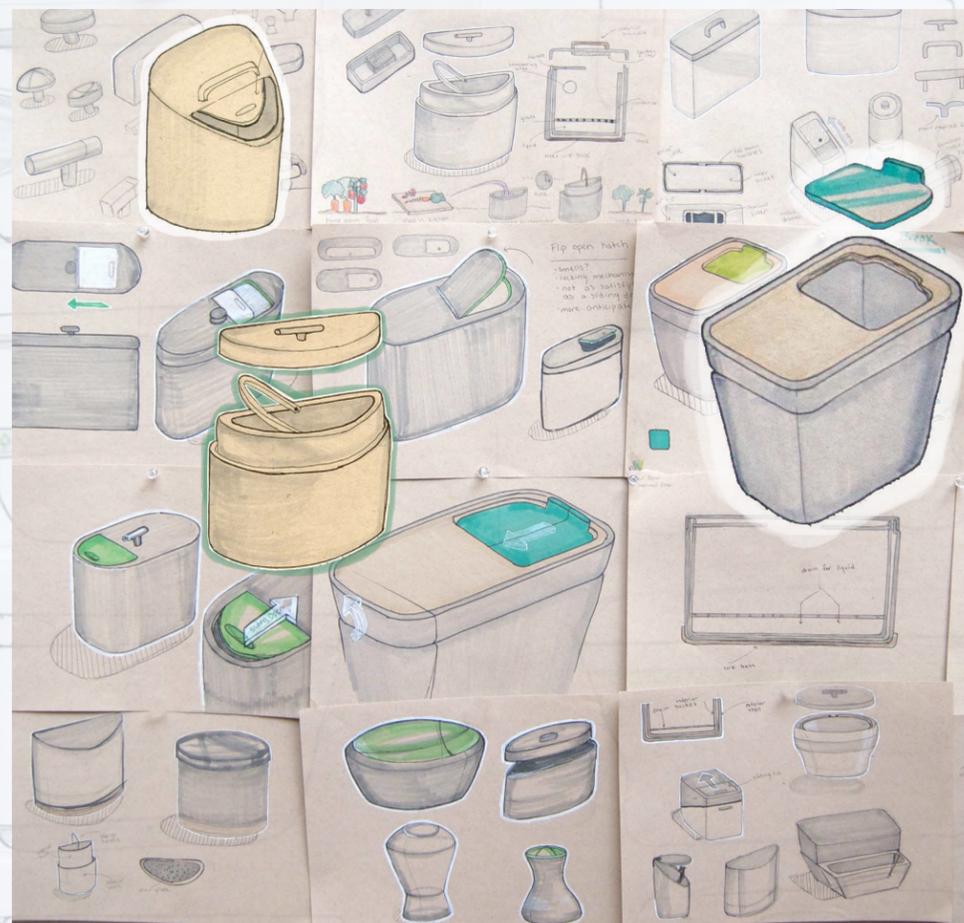
1.2 Submitting Category

Student Entry
Use of Autodesk Fusion 360™
Use of Aluminum

2.1 Product Title and Description

A fresh look at the need to stimulate at-home composting - OLI is a convenient food scraps bin that breaks the common misconceptions of composting, encouraging a wider range of households to enrich our environment, rather than continue to destroy it. With an average of 474 pounds of food waste generated each year by every household, a large percent of our landfill waste could be composted and returned to the Earth. OLI rests elegantly on the kitchen counter and allows users to collect compostable waste easily, and then cleanly and convenient transport it to their personal composting bin or their local collection site in neighborhoods or apartment complexes.





ITERATION

Sketch iteration followed by modeling allowed me to really understand the form of the food scraps bin. Full scale modeling revealed details and features that improve functionality and aesthetics. Rounded corners softened the form, preventing it from looking like an industrial garbage bin. Cues from other counter top appliances influenced some design decisions. It was also crucial to think about the foot print OLI has on the counter. This drove the decision to work towards a thinner form that could be pushed up against the back splash and out of the way.

STORY BOARD

Because the goal of OLI is to both increase and improve the composting experience, it was crucial to work through all possible scenarios the user could find themselves in, and pin point any areas of the experience that could be unpleasant or difficult. A simple sliding door in the lid lets the user drop in food scraps throughout their day without having to lift the lid. At the end of the week, or when the inside bin become full, the top is rotated open to reveal an ergonomic handle enclosed underneath. This handle is lifted and used to carry the interior bin outside and to the composting area.



Slide Door Open to Drop In Food Scraps



Open Lid Once Container Is Full



Use Handle to Remove Interior Bin

2.3 Illustration of the Product's System

Distribution

Filters are sent to the local assembly facilities to be packaged with the food scraps bin. However, when consumers order refills they are sent directly from the filter production center to the home of the user, reducing the carbon footprint of transportation.

Processing of Shells

Using a new entirely self-sustaining process, coconut shells are converted to char that can be used in the activated carbon for the filter.

START: Collection of Coconut Shells

Coconut shells are collected from coconut plantations after the edible parts are used.

Manufacturing and Distribution

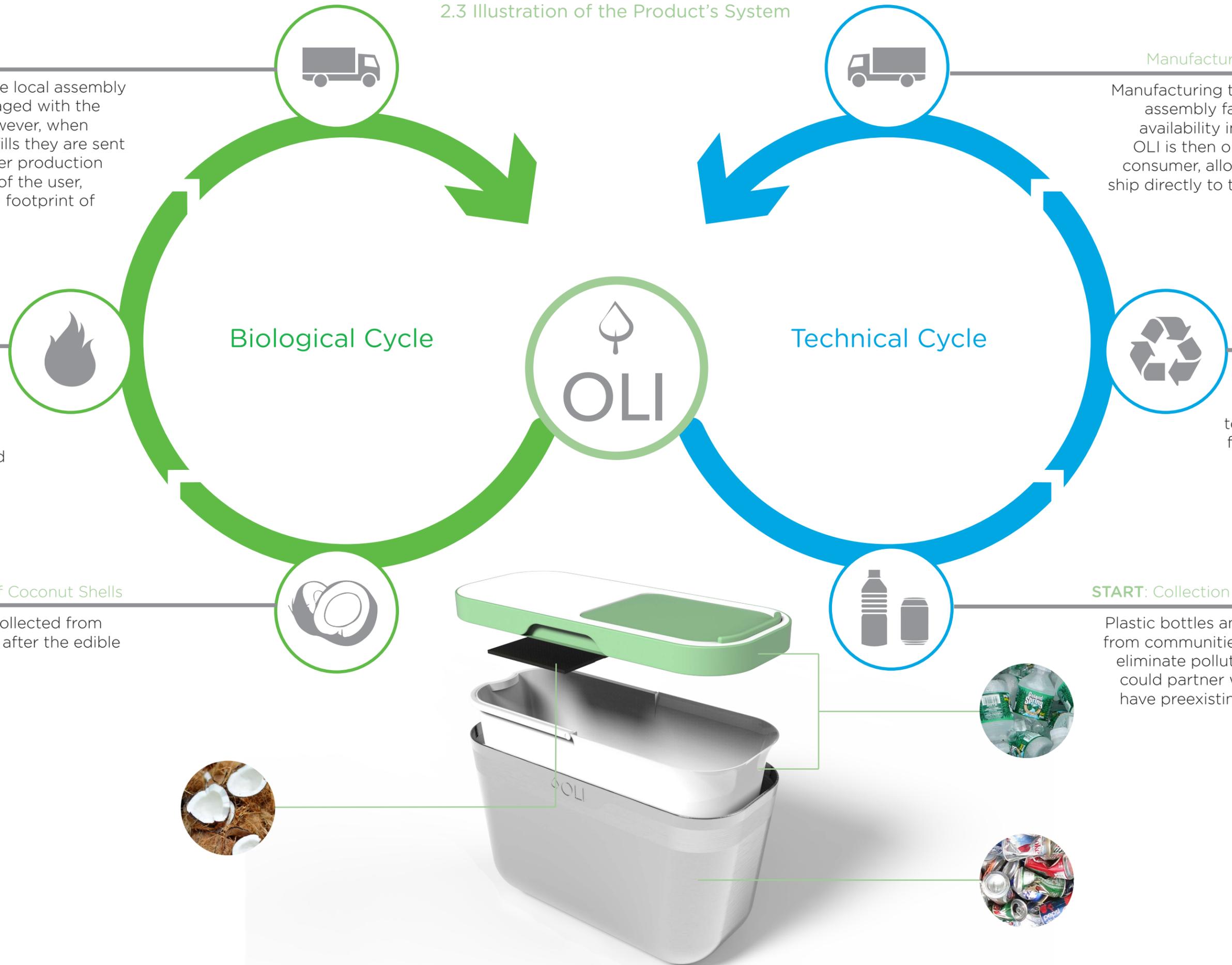
Manufacturing takes place in a local assembly facility, increasing job availability in local communities. OLI is then ordered online by the consumer, allowing the product to ship directly to the user, eliminating the middle man.

Material Processing

PET and aluminum are processed in US-based facilities to reduce the carbon footprint that comes from outsourcing. Facilities use sustainable and ethical processes.

START: Collection of Bottles and Cans

Plastic bottles and cans are recycled from communities and companies to eliminate pollution. The OLI system could partner with companies that have preexisting recycling systems set up.



3.0 Reutilization Cycle & Business Model

BUSINESS MODEL

Since increasing environmental awareness is of utmost importance, OLI would offer consumers a discount in return for bottles, cans, and scrap aluminum. This provides a direct relationship between the consumer and the manufacturing of the product. Additionally, OLI would provide the consumer with the necessary shipping boxes if they decide they are finished with the product. This creates a direct flow of material to the company.

Carbon Refill Subscription

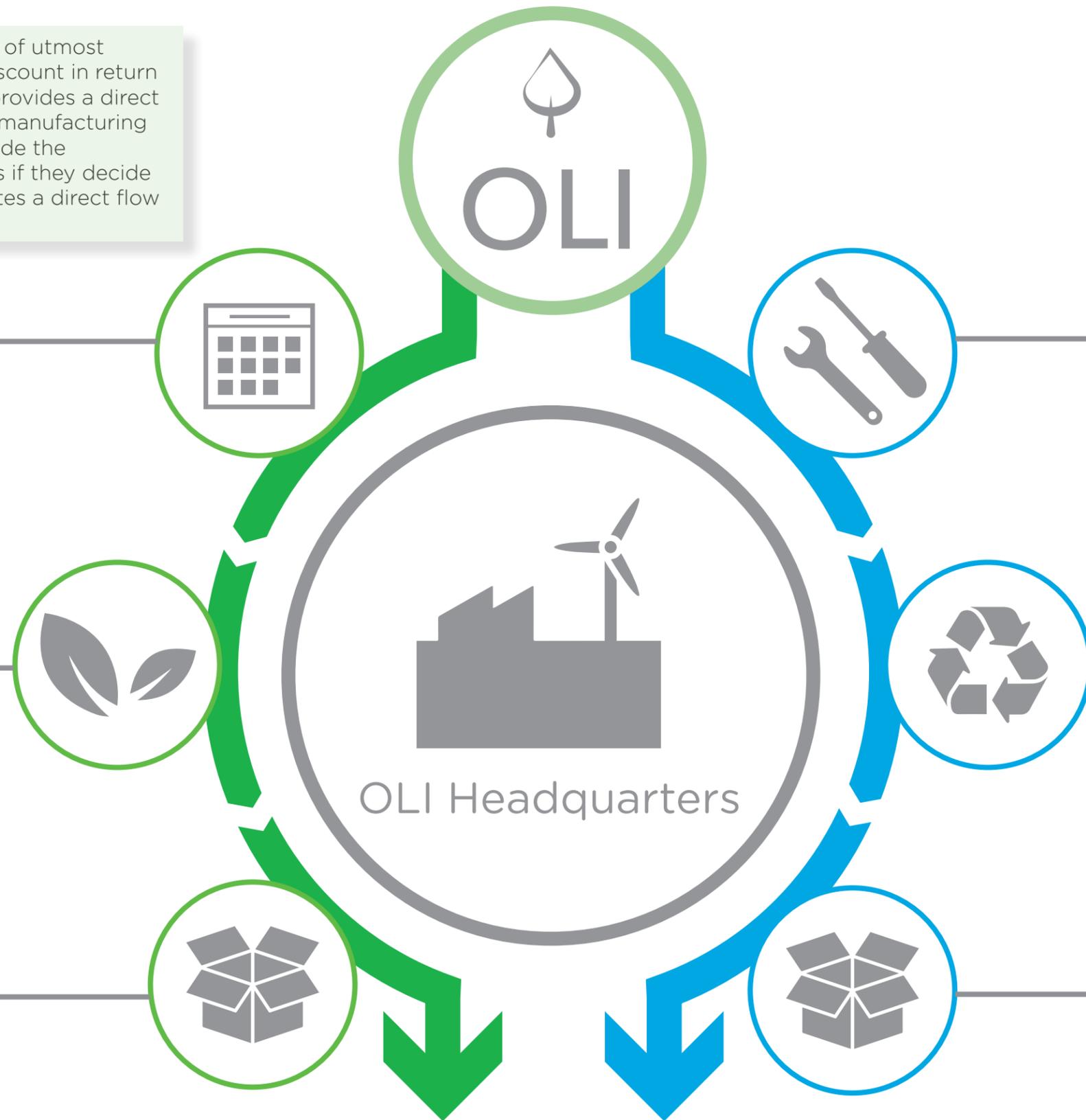
Consumers can register for a carbon refill subscription service. Every 3 months, they receive a replacement carbon filter. This opens the door for the possibility of partnering with other companies each cycle and including a free item in their subscription box, i.e. seed packets or coupons to environmentally aware companies.

Disposal of Old Filters

At the end of its life, the carbon filter can be broken up and mixed into the soil in the consumer's garden. Carbon provides many benefits for the soil and plants.

Packaging Composting

The filters are sent in compostable cardboard and paper packaging that can be added to the compost pile. The compostable packaging reduces waste added to our landfills and promotes quality composting.



Repairs and Replacement System

Consumers can return parts of their food scraps bin for repairs. If the user decides that are finished with the product, it may also be sent back.

Recycling

Returned parts are recycled into new products.

Recycling

Consumers receive replacement parts in compostable packaging. Similar to the filter subscription packaging, it can be added to the compost pile for many benefits.

4.1 Material Selection Overview



The OLI food scraps bin is made from materials that are constantly available for recycling. Plastic bottles (PET) and aluminum cans are contaminating our ecosystems. Instead, we should be extending their life span through a product that gives back to the environment.

4.3 Material Health

Recycled Aluminum - NFPA Rating: 0

Although some toxic materials are present during the recycling process of aluminum, it is much more efficient to recycle aluminum instead of producing virgin material. This process requires almost 95% less energy.

Recycled PET Bottles - NFPA Rating: 0

PET has no known health issues and is one of the most easily recyclable plastics known to date. Cradle to Cradle approved additives can be used for strength and color.

Coconut Shell Carbon - Biologically Inert

Coconut shells are a renewable resource that can provide us with many benefits. The Indiana Institute of Science has developed a method that can produce activated carbon (used in the filter) without producing greenhouse gases (1).

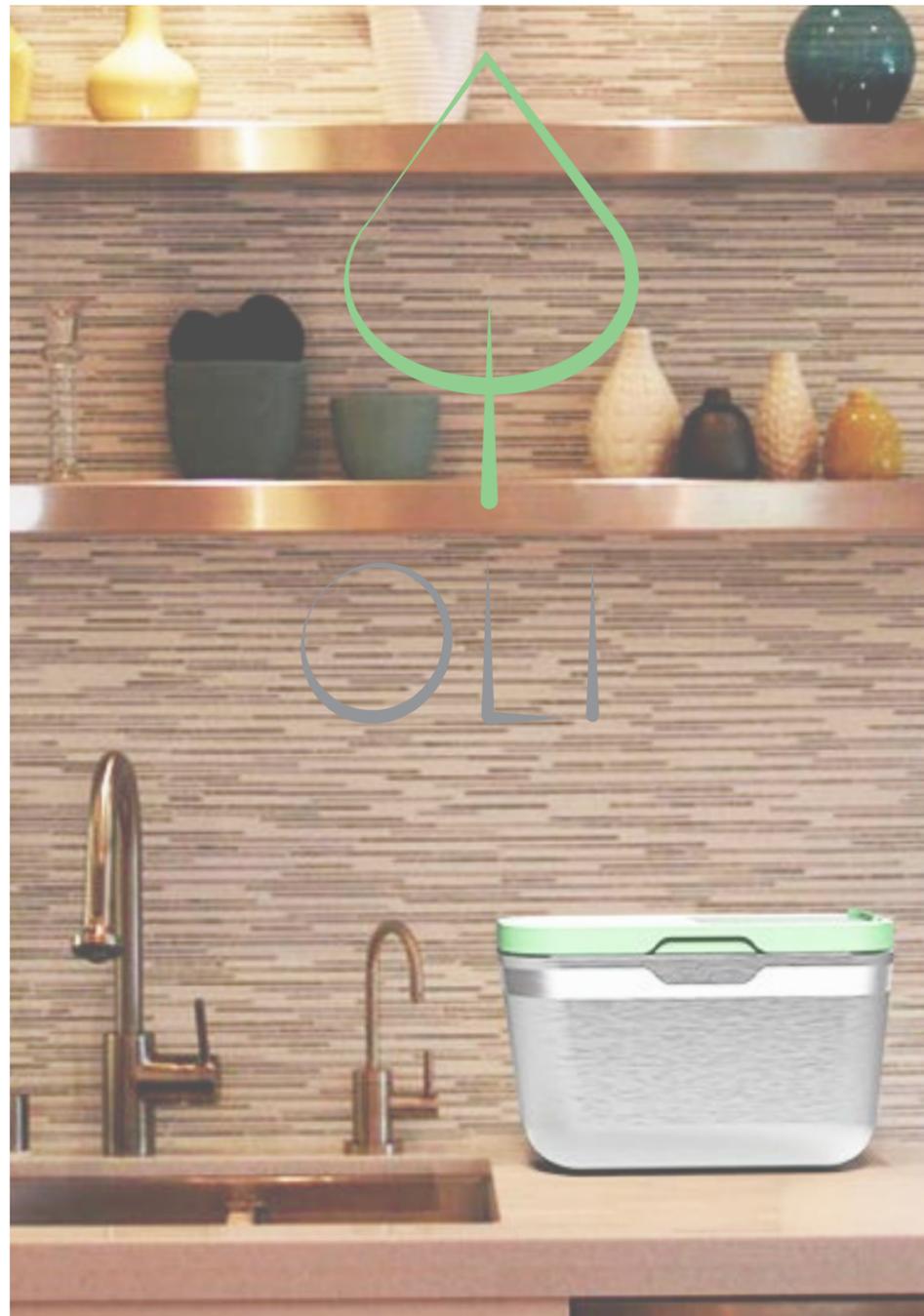
(1) [Coconut Carbon Process](#)

Calculation for the NFPA Health Score: 0

4.2 Material Reutilization

$$\frac{(\% \text{Recycled or Rapidly Renewable} * 1) + (\% \text{Recyclable or Compostable/ Biodegradable} * 2)}{3}$$

Calculation for OLI: $\frac{(100\% * 1) + (100\% * 2)}{3} = 100\%$



5.0 Design with Autodesk Fusion 360™



After building multiple cardboard models, I used Autodesk Fusion 360™ to finalize all parts of the food scraps bin.

The direct modeling capabilities of the program positively impacted my design process for OLI. The ability to iterate several models within one file made it easy and effective to compare multiple form and feature variations. The rollback tree allowed me to jump back in the model and make quick adjustments, without having to start over, which can sometimes be the case in other computer modeling software. The cloud-based platform provided peace of mind that my model was always saved in its latest state and available to access from any computer.

The joint features were a necessity when it came to understanding how the parts worked and moved in and around each other. The animation tool allowed me to visualize the process of using OLI in real time, making sure that the relationships applied to different parts functioned as needed.

