



Re(al)cycling Bin

# **Re(al)cycle Bin**

Victoria Gwynn

Multi-disciplinary Design, University of Utah  
DES 3520-001 Design Product Studio 2, Tsotsounakis  
Spring 2021

In partnership with Yestermorrow

# Table of Contents

<b>Title Page</b>	<b>i</b>
<b>Table of Contents</b>	<b>ii</b>
<b>Designer’s Statement</b>	<b>1</b>
<b>Wishcycling</b>	<b>2</b>
<b>Single Stream Recycling</b>	<b>3</b>
<b>Multi Stream Recycling</b>	<b>4</b>
<b>Contamination</b>	<b>5</b>
<b>Case Studies</b>	<b>6-7</b>
<i>Germany</i>	6
<i>San Francisco</i>	6-7
<i>Kamikatsu</i>	7
<i>Assorted Facts</i>	7
<b>Plastic Bags</b>	<b>8</b>
<b>Re(al)cycle Bin</b>	<b>9-13</b>
<i>Interior</i>	11-12
<i>Exterior</i>	13
<b>Bibliography</b>	<b>14-15</b>
<b>Colophon</b>	<b>16</b>
<b>Credits</b>	<b>16</b>

# Designer's Statement

When I started this project, it was with a sense of hope and a desire to help bring the option to recycle to the town of Bluff, Utah. Instead, I found myself becoming more and more frustrated as I learned more and more about the state of the US recycling system. Side-by-side with amazing technologies and systems in other countries were the US's depressingly low recycling numbers and the realization of how few recyclables actually get recycled.

Despite the fact that all the information, precedence, and technology needed to improve our recycling is there, it is just not being used and implemented. Instead, we put all the responsibility and pressure to recycle on consumers. We allow manufacturers to do as they will rather than implementing regulations that would force them to take responsibility for the life of their packaging. We decide what to recycle based on profit margins rather than environmental impact.

I don't know about you, but this makes me angry. I take the time to recycle because I want things to be reused and remade. I don't want my recyclables to be redirected to a landfill and incinerated because they became too contaminated in transit, or because someone decided it is not worth the cost.

With this knowledge in mind, I couldn't bring myself to create something that would help bring recycling to Bluff. What would the point be? I had no desire to contribute to a system that is so badly broken. This led to the creation of the Re(al)cycle Bin, a speculative design meant to encourage people to confront the reality of our current recycling system by bringing it into our homes.

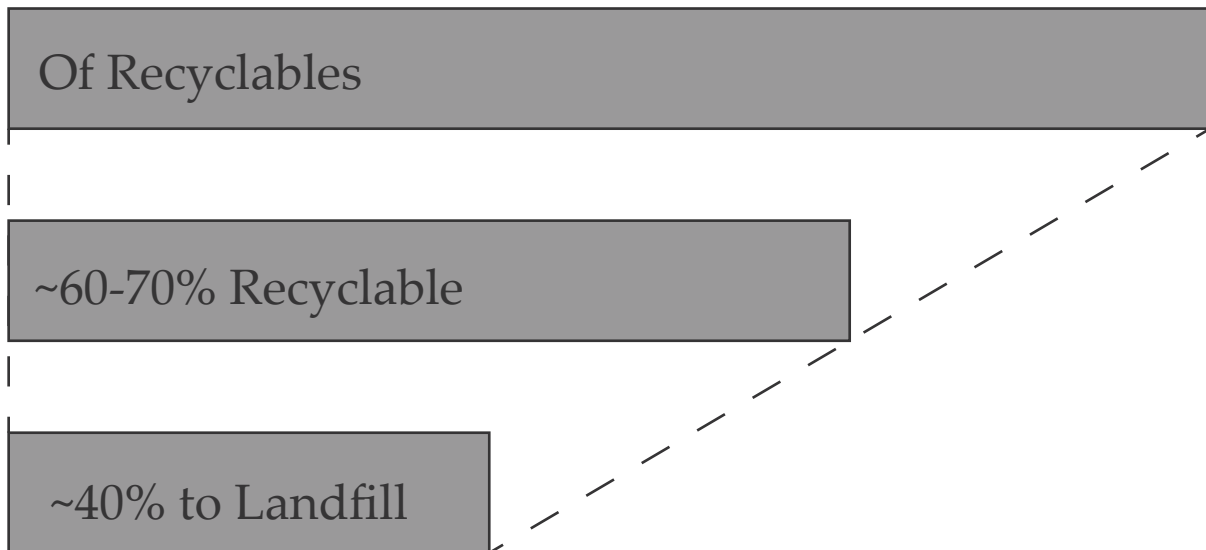
# Wishcycling

Wishcycling is the act of putting something in a recycle bin with the hope that it can be recycled.<sup>1</sup> Wishcycling stems from the desire to be environmentally conscious and a lack of recycling education. We as consumers hear a lot about how we should recycle and that it is good for our planet. We

feel a lot of pressure to be responsible, but at the same time, we are not provided an education on what items are accepted in our

*the act of putting something in a recycle bin with the hope that it can be recycled*

area. Because of this, only an estimated 60-70% of recycled materials are actually recyclable<sup>2</sup> and about 40% of that is redirected to landfills<sup>3</sup> and incinerated due to things like material contamination.



<sup>1</sup> "Wishful Recycling: More Harm than Good," School of Marine and Environmental Affairs (blog), <https://smea.uw.edu/currents/wishful-recycling-more-harm-than-good/>.

<sup>2</sup> "Americans Are Bad at Recycling. Here's How the World Does It Better | Green America," <https://www.greenamerica.org/rethinking-recycling/americans-are-really-bad-recycling-only-because-we-re-not-trying-very-hard>.

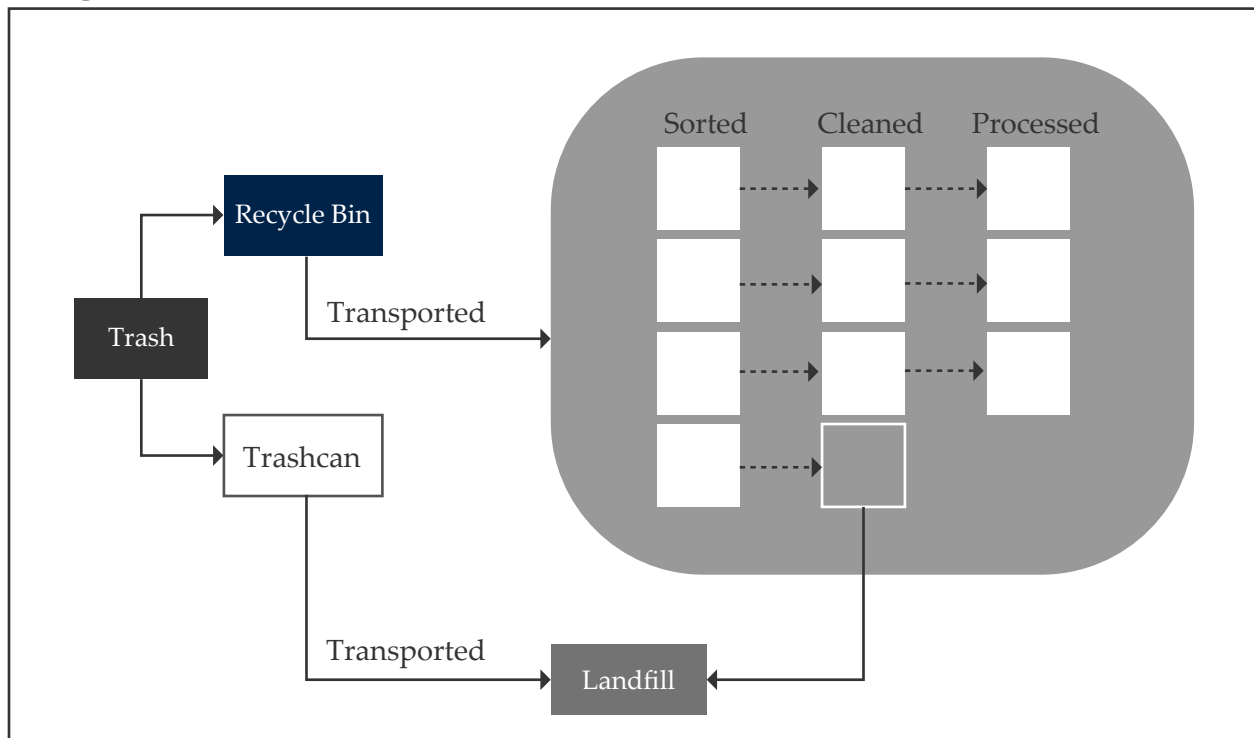
<sup>3</sup> "The Era Of Easy Recycling May Be Coming To An End | FiveThirtyEight," <https://fivethirtyeight.com/features/the-era-of-easy-recycling-may-be-coming-to-an-end/>.

# Single Stream Recycling

A single stream recycling system starts with all recyclables being placed in one bin. Recyclables are transported to a recycling facility where workers give them a quick presort and try to remove contaminants as they spot them. Recyclables then travel through a series of machines that sort out particular materials. They are then cleaned, processed, and packaged for manufacturer purchase. An estimated 40% of recyclables are redirected to landfills with this system.



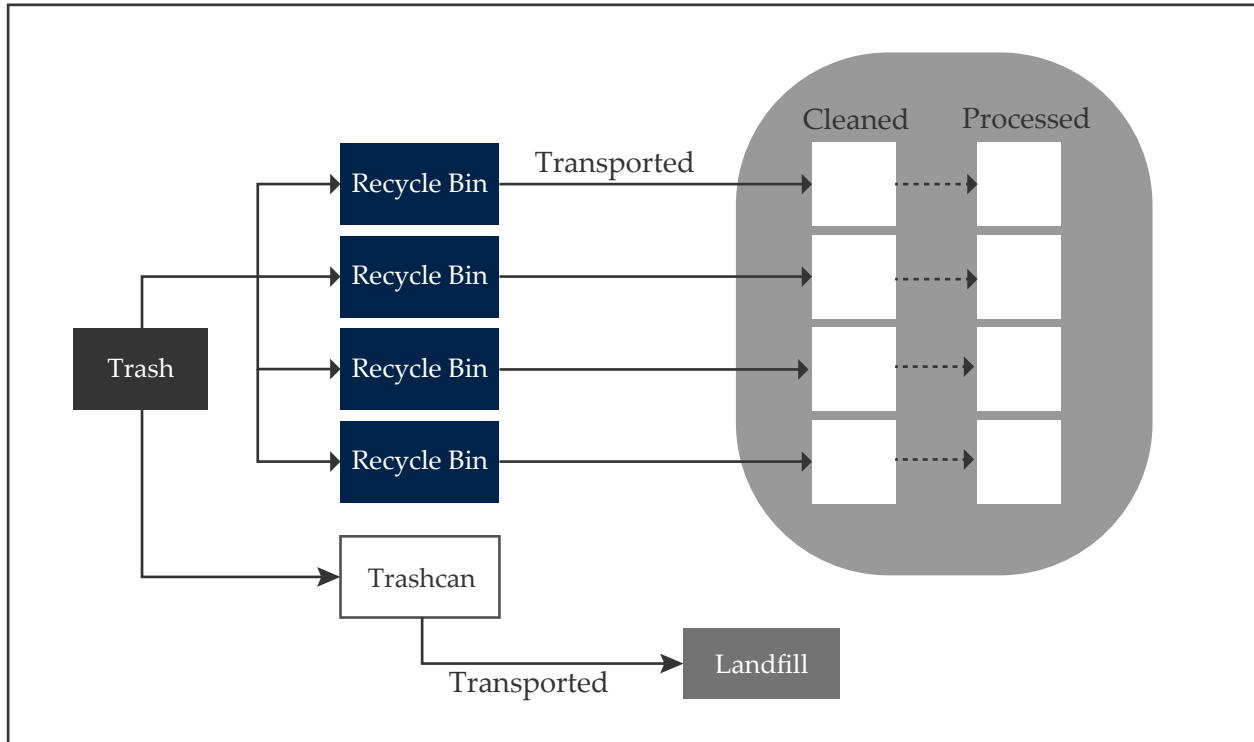
## Single-Stream Process





# Multi Stream Recycling

## *Multi-Stream Process*



Multi stream recycling uses multiple bins to presort materials. Consumers are responsible for sorting their recyclables into several bins. Recyclables are then transported to a recycling facility where they are cleaned, processed and packaged for manufacturer purchase. Lower contamination rates means less is being redirected to landfills.<sup>5</sup>



## Contamination

Contamination can happen in several ways. Wishcycling introduces contamination by introducing non-recyclable items into the recycling stream. Food and liquid residue render things like paper and cardboard unusable, and can interfere with machine sorting.<sup>6</sup>

Compaction in garbage trucks crushes glass and metals. This in turn gets ground into softer materials and is impossible to separate. Single stream recycling tends to introduce higher contamination rates and ultimately results in contaminated products. Manufacturers have commented that this has been resulting in lower quality materials when using recycled materials.<sup>7</sup>



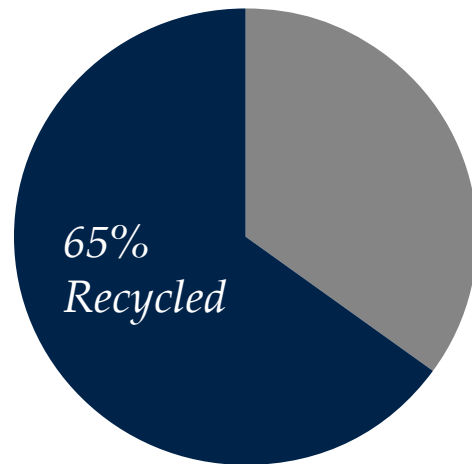
# Case Studies

## Germany

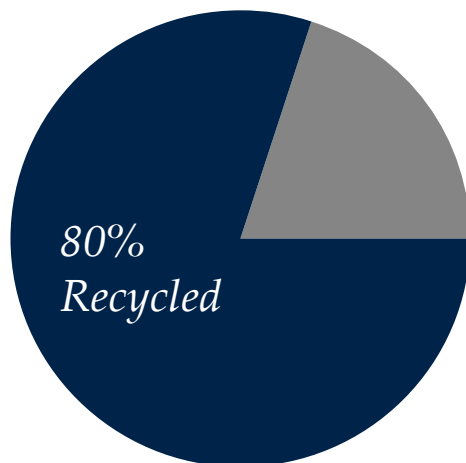
Germany recycles 65% of their solid waste<sup>8</sup>. They use a multi stream recycling system with 6 bins. This has been found to save the government a significant amount of money and reduces contamination. While there was push-back at first, citizens have reported that it has become habit, and even a source of national pride.

The German government has implemented policies that help with recycling by targeting manufacturers.. In 1991, they implemented a packaging ordinance that requires manufacturers take responsibility for the recycling of their product packaging. The Closed Substance Cycle and Waste

Management Act targets producers and encourages them to focus on 1 of 3 strategies; waste avoidance, waste recovery, and environmentally compatible disposal<sup>9</sup>.



## San Francisco



San Francisco has some of the best recycling numbers in the US, with 80% of solid waste being recycled or composted. Part of this is due to a 2009 ordinance that made recycling and composting mandatory for businesses and residents.

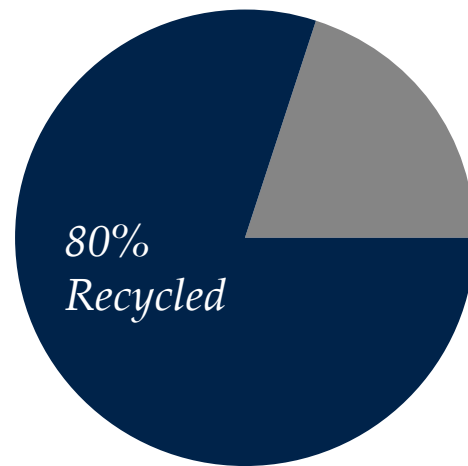
San Francisco sorts their waste into three bins, trash, recyclable, and organic waste. They have implemented a pay as you throw away model, meaning the

## San Francisco Cont.

more that is thrown in the trash, the higher the garbage bill. The city offers free “trash audits” to businesses to help them identify ways to eliminate waste. Hard to recycle materials such as Styrofoam and plastic bags are banned, and San Francisco is working with manufacturers to have them take more responsibility for packaging.<sup>10</sup>

## Kamikatsu, Japan

Kamikatsu is a small mountain community of around 2,000 located on Shikoku Island. Trash was previously incinerated, leading to citizens getting sick and complaining of the bad smell. In 2003, the town adopted a zero-waste plan to remedy the issue. Residents now sort recyclables into 45 categories after carefully cleaning items to remove solid and liquid contaminants.



Municipal pickup is not offered, so citizens bring their recycling to the recycling center where workers check that items are properly sorted. Citizens opposed this system at first, but have found that they are enjoying the benefits of cleaner air, and other benefits. More jobs have been created via the recycling center, a factory that turns recyclables into new items, and a store that allows residents to take still usable recycled items for free.<sup>11</sup>

## Assorted Facts

- Norway has a 97% recovery of all plastic bottle waste.<sup>12</sup>
- Sweden teaches citizens paper making and other reuse principles from an early age.<sup>13</sup>
- As of 2019, the US recycles only 34% of solid waste.<sup>14</sup>

<sup>10</sup> Americans Are Bad at Recycling. Here's How the World Does It Better | Green America., <https://www.greenamerica.org/rethinking-recycling/americans-are-really-bad-recycling-only-because-were-not-trying-very-hard>.  
<sup>11</sup> The Kamikatsu Zero Waste Campaign: How a Little Town Achieved a Top Recycling Rate, *nippon.com*, July 13, 2018, <https://www.nippon.com/en/guide-to-japan/ga000038/>.  
<sup>12</sup> Luana Steffen, "Norway Leads The World With Its Incredible Recycling Scheme," *Intelligent Living (blog)*, May 24, 2020, <https://www.intelligentliving.com/norway-incredible-recycling-scheme/>.  
<sup>13</sup> From Trash to Treasure, *Blue Ocean Strategy (blog)*, June 20, 2017, <https://www.blueoceanstrategy.com/blog/trash-treasure-sweden-recycling-revolution/>.  
<sup>14</sup> Global MSW Recycling Rates by Country | Statista, accessed December 2, 2021, <https://www.statista.com/statistics/1052439/rate-of-msw-recycling-worldwide-by-key-country/>.

# Plastic Bags

It is no secret that the U.S. as a whole has a disposable mindset when it comes to our product. This is not helped by things like claims that plastic bags are the most eco friendly option that an individual can choose at the register. This is technically true if we only consider the environmental cost of production of plastic, paper, and reusable bags<sup>15</sup>. When we look at the life of the materials, however, we can see that plastic bags never really break down. Instead, they degrade into smaller and smaller pieces and impact ecosystems on unfathomable scales.

*Plastic bags are the poster child of the many issues that currently exist in Utah's recycling program.*

Recycling facilities consider plastic bags to be a contaminant.<sup>16</sup> They will throw out any recyclables they receive if they are in a plastic garbage bag. Plastic bags that make it into the factory get tangled in machines and halt production lines until a factory worker is able to clear out the obstruction. This is both dangerous for the worker, and is a costly stop for the factory. Some cities have banned plastic bags, but they face opposition from groups such as the American Recyclable Plastic Bag Alliance, which proudly proclaims themselves to be the front line defense against bag bans.<sup>17</sup>



Photo by Griffin Woodridge on Upplash

# Re(al)cycle Bin



*\*The Re(al)cycle Bin is a speculative design. It's purpose is to draw awareness to our problematic recycling system by bringing the incineration practices of our landfills into our homes, mirroring the path many of our recyclables end up taking.*

# Re(al)cycle Bin



The Re(al)cycle Bin solves the problems in our current recycling system by cutting out the middle man. No more putting your recyclables in the recycling bin only for them to be sent to a landfill for incineration. By incinerating recyclables in home, the Re(al)cycle bin effectively eliminates wishcycling and product contamination.

And rather than keeping things out of sight, out of mind, the Re(al)cycle Bin releases smoke and toxic fumes directly into the users home. By mirroring the path of many recyclables, the Re(al)cycle Bin will force users to open their eyes to the truth of our recycling system.

Hopefully, the jarring experience provided by the Re(al)cycle Bin will soon have people clamoring for improvements and upgrades to our ineffective recycling habits.



## *Interior*

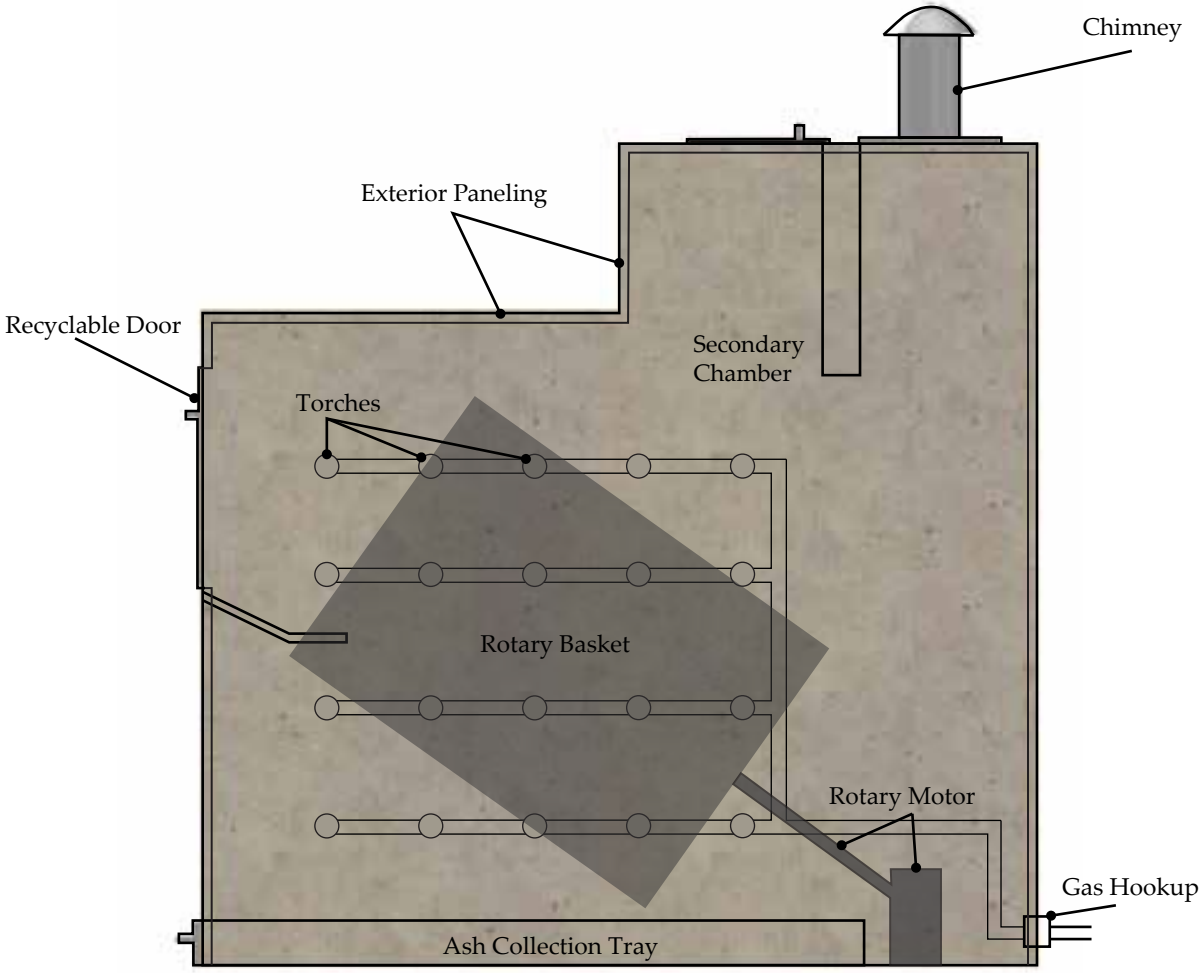


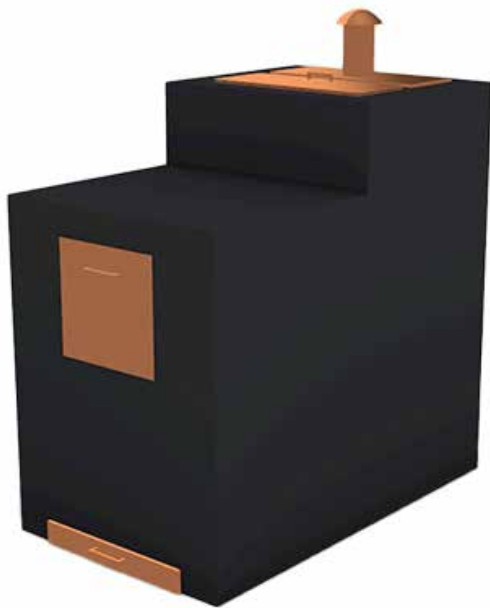
The Re(al)cycle bin interior is constructed with refractory bricks, otherwise known as fire bricks. Recyclables are deposited into a rotary burn basket that allows recyclables to dry and crumble into ash. Ash then falls through the basket into a removable ashtray for disposal.

Heat is provided by a series of torches fueled by natural gas. This allows the Re(al)cycle Bin to maintain a steady temperature of

*Interior, Cont.*

2000°F, the same temperature used in larger scale incinerators to burn off most toxic gases. Smoke and remaining gases escape through a chimney. A secondary chamber before the chimney allows heat to build up and aids in airflow. A door at the top allows users to check the interior of the incinerator if needed.





### *Exterior*

Paneling or other cosmetic treatments can be added to the exterior of the Re(al)cycle Bin, allowing households to customize the bin to match their kitchen aesthetic. This is a key feature, considering that the Re(al)cycle Bin will be a mandatory addition to every household.

# Bibliography

- “Americans Are Bad at Recycling. Here’s How the World Does It Better |  
<https://www.greenamerica.org/rethinking-recycling/americans-are-really-bad-recycling-only-because-were-not-trying-very-hard>.
- Blue Ocean Strategy. “From Trash to Treasure,” June 20, 2017.  
<https://www.blueoceanstrategy.com/blog/trash-treasure-sweden-recycling-revolution/>.
- Earth911. “Germany: A Recycling Program That Actually Works,” July 11, 2017. <https://earth911.com/business-policy/recycling-in-germany/>.
- “Global MSW Recycling Rates by Country | Statista.”  
<https://www.statista.com/statistics/1052439/rate-of-msw-recycling-world-wide-by-key-country/>.
- Lakhan, Calvin. “A Comparison of Single and Multi-Stream Recycling Systems in Ontario, Canada.” *Resources* 4, no. 2 (June 2015): 384–97.  
<https://doi.org/10.3390/resources4020384>.
- nippon.com. “The Kamikatsu Zero Waste Campaign: How a Little Town Achieved a Top Recycling Rate,” July 13, 2018.  
<https://www.nippon.com/en/guide-to-japan/gu900038/>.
- School of Marine and Environmental Affairs. “‘Wishful Recycling’: More Harm than Good.”  
<https://smea.uw.edu/currents/wishful-recycling-more-harm-than-good/>.
- SJFUtah. “FULL CIRCLE RECYCLING.”  
<https://www.sanjuanfoundationutah.org/fullciclerecycling>.
- Steffen, Luana. “Norway Leads The World With Its Incredible Recycling Scheme.” *Intelligent Living* (blog), May 24, 2020.  
<https://www.intelligentliving.co/norway-incredible-recycling-scheme/>.
- TED-Ed. Which Bag Should You Use? - Luka Seamus Wright and Imogen Ellen Napper, 2020. [https://www.youtube.com/watch?v=3\\_fjEc4aQVk](https://www.youtube.com/watch?v=3_fjEc4aQVk).

“The Era Of Easy Recycling May Be Coming To An End |  
FiveThirtyEight.”<https://fivethirtyeight.com/features/the-era-of-easy-recycling-may-be-coming-to-an-end/>.

“Where Exactly Is Your Recycling Going? - Utah Business.”.  
<https://www.utahbusiness.com/utahs-recycling-industry/>.



*This document is set in Palatino Linotype, version of the typeface designed by Hermann Zaph and released in 1949. The information included in this document was gathered between November and December of 2021, with the document being written using Microsoft Word and designed on Adobe Illustrator. Photographs were sourced from Upsplash and individual photographers are credited both on their photos and below. Renderings of the Re(al)cycle Bin were created using the 3D Modeling Software Rhino and enhanced using Adobe Photoshop.*

*Yestermorrow is a Design/Build school that teaches hands-on courses in construction, architecture, and much more to those of all ages, all with sustainability and community in mind. As of December 2021, they have campuses in Bluff, Utah and Waitsfield, Vermont. Check them out on their website at <https://yestermorrow.org/>*

*Photographs were provided through Upsplash, with photos from "the blowup," Lucas van Oort, Pawel Czerwinski, and Gavin Woolridge. The base photograph used in renderings was taken by Block Top Kitchens.*