

Restaurant, Food & Hospitality Industry Sustainability Case Study

By Alex Gerszten
Massachusetts Institute of Technology (MIT), MBA
Yale University, BA

Introduction

Sustainability in the Restaurant, Food and Hospitality Industries

The restaurant, food and hospitality industries are rampant with sustainability initiatives, from carbon neutral pledges to environmentally-friendly sourcing and agricultural practices. The focus of this analysis is to review the approach organizations take in dealing with displaced Furniture, Fixtures and Equipment (FF&E) in three key sectors of the food industry. They are Supermarkets, Restaurants and Food Service, specifically universities. Organizations that operate in the Food Industry proactively initiate sustainability programs or are pressured by their local communities and by the financial markets to adopt Environmental Social Governance (ESG) programs. In early 2020, convenience store chain Wawa announced that 100% of their coffee is now sustainably sourced.¹ Whataburger recently announced new restaurant designs that will more heavily rely on renewable energy sources.² Other organizations such as Cal Poly, the Culinary Institute of America, and Brookshire Grocery have similarly followed suit.

Within restaurants and hospitality settings—particularly with regards to technology and equipment—businesses are starting to take note. In its certification process, the Green Restaurant Association lists “Sustainable Durable Goods & Buildings Materials” as its third most important criteria.³ There has also been a significant push towards sustainability within the hotel and hospitality industry. Many have called for a Code of Eco-Friendly Sustainable Ethics, mirroring the World Tourism Organization’s Global Code of Ethics for Tourism. Travelers are becoming more aware of companies’ commitment to sustainable practices, and many are willing to pay more for environmentally sustainable options.⁴

Waste is top of mind for many involved in the food industry. Fast food chains are increasingly adopting Internet-of-Things (IoT) monitoring systems to assist managers in identifying wasteful practices allowed by out-of-date equipment. The pilot of one IoT system allowed a major American fast-food chain to save 7.4 million gallons of water, which is the equivalent to more than 11 Olympic swimming pools in one year.⁵

¹ [Convenience Store News](#)

² [Spectrum News 1](#)

³ [Green Restaurant Association](#)

⁴ [Hospitality Net](#)

⁵ [Modern Restaurant Management](#)

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The focus of this study is on the Furniture, Fixtures and Equipment (FF&E) displaced in normal operations. We chose to dive deeper into the operations of a leading provider of asset disposition services, TAGeX Brands.

TAGeX Pushing the Sustainability Envelope

Through its innovative and unique approach to sustainable solutions, TAGeX is propelling restaurants, supermarkets, convenience stores and food service providers towards this green revolution. Furniture, fixtures, and equipment are oftentimes dumped in landfills at the end of its first use or might be taken away by a salvage company to an undefined location.

Much of the FF&E used in the Restaurant and Food sectors is constructed of materials that have a protracted period of time to disintegrate when placed in a landfill. Stainless steel for example, a material used in a significant percentage of equipment is estimated to take between 100 and 1,000 years to disintegrate, according to the British Stainless Steel Association. TAGeX's focus is to foster a circular economy model in which equipment is able to extend its useful life by at least an extra lifecycle, and in some cases another two, three, or four uses.

Examples and Emissions Analysis

TAGeX embodies a circular economy, waste reducing model. Not only does the company curb carbon emissions and junk in landfills, but clients are also able to recognize a clear link to their companies' sustainability directives, as well as benefits to their communities and general mission and vision statements.

TAGeX's most notable sustainability win is enabling several companies to extend the life cycle of a given product. When any given item, such as an oven, is reused more than once, this could save the carbon emissions involved with reproducing another one of these items from scratch. This phenomenon is analyzed through a **Life Cycle Assessment (LCA)**, in which one is able to calculate the emissions from any given product as long as there is available data on the kilograms of CO₂ emitted into the atmosphere for a given kilogram produced of a certain material (see diagram below).

In order to estimate the environmental impact of TAGeX's work, we performed a preliminary Life Cycle Assessment for three of their clients from different sectors. These different project types complement the sustainability story that each of Yale Hospitality, Hopdoddy, and Wegmans is able to tell. We then aggregate these figures into a cumulative estimate of avoided greenhouse gases that TAGeX enables each year.



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A complete life cycle assessment includes all of the above components of a product's existence

Wegmans

TAGeX is a trusted partner for Wegmans, the 14th largest supermarket chain in North America.⁷ Many industry analysts consider Wegmans one of the most innovative and best operators in the United States, if not the world.⁸

TAGeX's work for Wegmans has run the gamut of services, including liquidating Furniture, Fixtures and Equipment (FF&E) from a location, redeploying assets across different Wegmans locations, and the liquidation of unused assets from storage warehouses. The primary focus is to sell displaced assets on one or more of TAGeX's Marketplaces. These include direct sales, auction sites, storefronts, and even reselling items on e-commerce platforms like Amazon and eBay. Wegmans has alone shipped over 120 truckloads of surplus into TAGeX's facilities beginning in January of 2021 through June of 2022.

⁶ [PRé Sustainability](#)

⁷ [Supermarket News](#)

⁸ [Washington Post](#)

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Wegman's storefront in State College, PA

The Wegmans story is one particularly relevant to TAGeX's emphasis on sustainability and waste reduction. As part of their company-wide sustainability vision, Wegmans focuses on four major initiatives to benefit the environment: "sourcing near [their] stores, eliminating waste, reducing plastic packaging, and reducing [their] carbon footprint."¹⁰ Wegman's Brian Colling particularly emphasized TAGeX's ability to help with the second and fourth focus areas above. He noted that "when Wegman's thinks about sustainability, it is not an economic decision. These are decisions to improve the environment, to help our people and communities, and to take care of the future of our world."

TAGeX provides a strong partner in these priorities, particularly given Wegmans' 2016 commitment to Zero Waste, a major initiative by the company. In describing this plan, Sustainability Department Manager Chris Foote talks through the "Sustainability Triple Win," an action that is good for "our customers, the company, and the environment."¹¹

Through TAGeX's shared belief in this Triple Win, they have been able to curb significant carbon emissions for Wegman's. Given our LCA model, we estimate **TAGeX is able to facilitate the avoidance of 963 kilograms of carbon dioxide**¹² with the average Wegman's engagement. This is comparable to the emissions of 500 CO₂ fire extinguishers.¹³

⁹ [Wegmans](#)

¹⁰ [Wegmans](#)

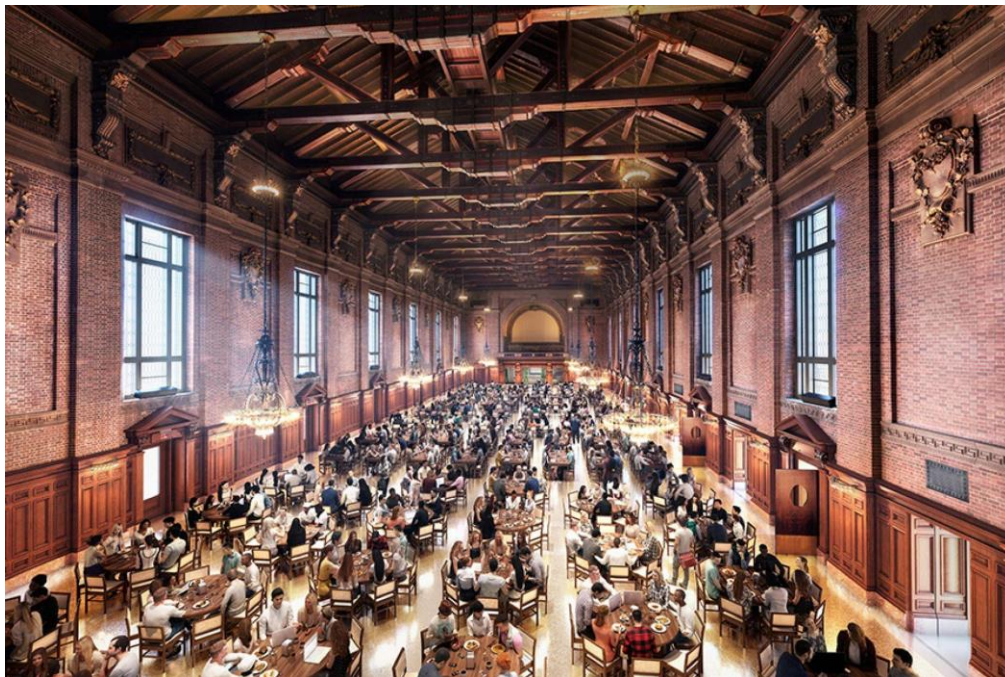
¹¹ [Wegmans](#)

¹² When claiming avoidance in this case and for the following two clients, this is to say that TAGeX facilitates the reuse of items that, if bought from scratch, would be responsible for this amount of carbon dioxide emissions. By not buying these items new, we assume that their reuse saves these emissions from entering the atmosphere.

¹³ [Crown Oil](#)

Yale Hospitality

Another client that TAGeX has worked with for years is Yale University Hospitality. They have liquidated and/or refurbished four different dining hall locations on campus—most notably assisting with the renovation of Commons Dining Hall (now part of “The Schwarzman Center”), a 14,000 square foot central dining location servicing thousands of students each day.¹⁴ TAGeX was entrusted with this Commons project that allowed the entire Yale community to realize a several year journey towards enriched student life around this renewed campus nucleus.¹⁵



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The Yale Commons dining hall after completion of the TAGeX project

Yale Hospitality Director of Asset Renewal & Planned Projects Dan Flynn described this engagement with TAGeX as a “home run.” He mentioned how “alumni were acquiring furniture and sending it to their classmates—buying tables and chairs that were anywhere between 30-60 years old.”

In addition to the alumni craze, Mr. Flynn emphasized controlling the end location of Yale Hospitality equipment as a key success in these projects’ sustainability stories. “Being able to choose the destiny of your end-of-life furniture and contributes to our constant quest to be sustainable. If you just get a construction company, they may be scrappers and make money that

¹⁴ [AKF Group](#)

¹⁵ [BDC Network](#)

¹⁶ [Yale Schwarzman Center](#)

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way, and they might just trash it all. Who knows what they are going to do with it. You're more in control of your project this way."

He also described the ability of TAGeX to facilitate worthy equipment to smaller businesses: "It's important to have these things recycled properly. There are lots of small local establishments that follow these auctions. We have well-maintained equipment, and the people that received things were really appreciative." He even went as far as to say that some of the transactions are able to save businesses entirely: "We had a woman last year who bought this equipment, and she couldn't even get any other equipment at all. The restaurant equipment industry, like many others, is struggling with supply chain issues. She wasn't going to be able to open. If she had not gotten the help from TAGeX she would've had to scrap the project." While TAGeX focuses on reuse and waste reduction, the ability to provide social and economic sustainability for large and small businesses is certainly another benefit of this innovative model.

Through our model, we found that for the average Yale Hospitality project (the Commons project being on the larger side of this average), **TAGeX is able to facilitate the avoidance of approximately 2,894 kilograms of carbon dioxide.** This is the equivalent of three cars driving on gasoline for an entire year.

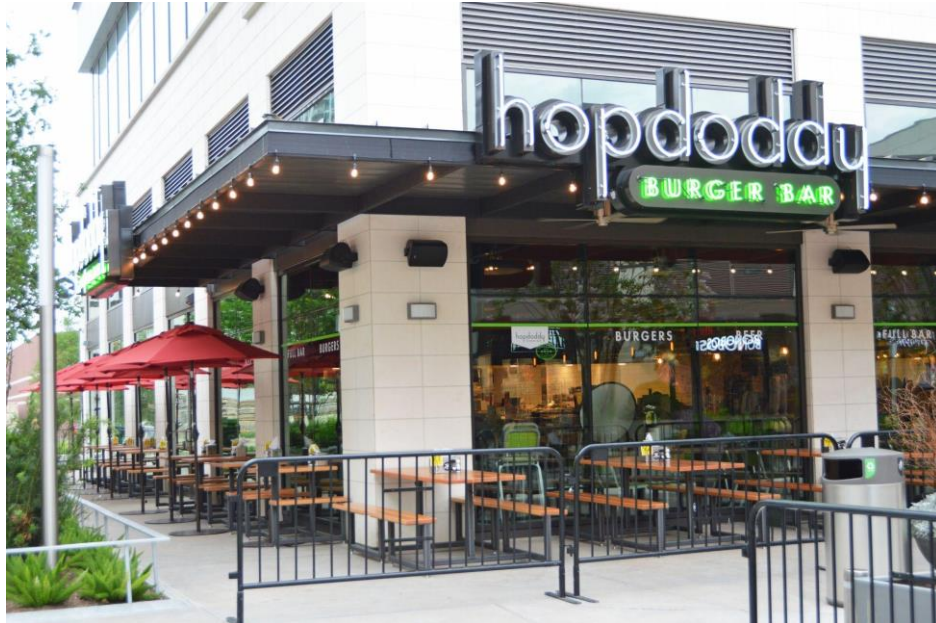
Hopdoddy

Another client that TAGeX has serviced several times is Hopdoddy, a handmade burger bar based in Austin, Texas, with 25 locations throughout Texas in addition to Tennessee, Colorado, Arizona, and Southern California. Founded in 2010, Hopdoddy was one of the pioneers in the "Better Burger" concept, a trend they embarked on alongside the likes of Shake Shack and BurgerFi. Hopdoddy is also growing significantly. With the acquisition of Texas-based Grub Burger Bar, Hopdoddy CEO Jeff Chandler established the HiBar Hospitality Group, which now manages 51 total restaurants and growing.¹⁷

Chandler, when discussing Hopdoddy's relationship with TAGeX, emphasized his own personal values for reuse and rejection of irresponsible consumerism. "In this country, we live in a disposable society, and it drives me nuts," he mentioned, emphasizing how TAGeX facilitates "the right thing to do." Having lead dozens of restaurant openings (and closings) during and before the pandemic, Chandler emphasized the need for reliable, high quality items, particularly in light of significant supply chain instability and a tight labor market in recent months and years. Similar to representatives from both Wegmans and Yale, he also mentioned the impact on the community: "We're doing what's better for our community and our ecosystem. It's not only good for the environment, but positively impacts the community by keeping waste out of landfills."

¹⁷ [Nation's Restaurant News](#)

Given our LCA model, we estimate **TAGeX is able to facilitate the avoidance of 3,838 kilograms of carbon dioxide¹⁸** with the average Hopdoddy engagement. This is comparable to the carbon emissions from burning about 4,000 pounds of coal.¹⁹



One of Hopdoddy's Houston locations

TAGeX Brands Overview

The founders of TAGeX Brands began managing programs for consumer brands in the Washington, D.C. market in 1987. Initial activities focused on placing food service kiosks into Supermarkets (i.e., frozen yogurt, coffee, and soup bars). Each time they brought a kiosk in, the customer (the supermarket) wanted them to manage the displaced equipment. Historically, vendors would dispose of removed items, with the outcome often ending up in a landfill. Seeing value in the items removed from locations, TAGeX focused on cleaning up the displaced items (e.g., refrigerators, ovens, slicers, and mixers) and selling them for the customers (largely to small independent operators). After sharing the proceeds, the customers asked TAGeX for help with other storage and retail closures and equipment liquidation.

¹⁸ When claiming avoidance in this case and for the following two clients, this is to say that TAGeX facilitates the reuse of items that, if bought from scratch, would be responsible for this amount of carbon dioxide emissions. By not buying these items new, we assume that their reuse saves these emissions from entering the atmosphere.

¹⁹ [United States EPA](#)

²⁰ [Eater Houston](#)

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What began by serving supermarkets quickly expanded to restaurants, food service operators, retailers, and convenience stores. TAGeX then became a go-to resource for accountants, lawyers, consultants, real estate companies, banks and others dealing with closures, asset redeployment, valuation, and liquidation.

Following years of growth and the need for a larger facility, the firm relocated its operations to the Finger Lakes Region of Upstate New York (2000), near Founder, Neal Sherman's hometown of Geneva, New York. This move prompted the redevelopment of a 1,000 acre portion of the former Seneca Army Depot (which served the military as a distribution center for supplies since the 1930's). The space has dozens of buildings where TAGeX Brands receives, stores, redeploys, sells, and ships equipment from around the nation.

In addition to the former Seneca Army Depot, TAGeX Brands has opened another regional facility in Dallas, Texas and has regional affiliations in all markets of the country.

Although the focus of this study are three firms, TAGeX has served hundreds of firms in the US, including: 41 of the top 50 Restaurant Chains in the US; 10 of the nation's top 25 Supermarket Companies; and, 8 of the top 25 Convenience Store Operators.

Cumulative Analysis

The above analysis certainly explains and quantifies a significant environmental, social, and economic impact for each client. However, given these figures, it would be useful to calculate the annualized environmental impact avoidance that TAGeX is able to facilitate. For each type of client (comparable to those described above), the avoided emissions would be as follows:

- Given **750 closures or remodeling initiatives each year**, TAGeX is able to facilitate the avoidance of **721,861 kilograms of carbon dioxide in *grocery stores***
- Given **600 closures or remodeling initiatives each year**, TAGeX is able to facilitate the avoidance of **1,771,251 kilograms of carbon dioxide in *large food providers (i.e., university dining services)***
- Given **1,800 closures or remodeling initiatives each year**, TAGeX is able to facilitate the avoidance of **6,907,907 kilograms of carbon dioxide in *restaurants***

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Combining the above figures, TAGeX is able to facilitate the **avoidance 9,401,020 kilograms of carbon dioxide each year.** For context, this is the number of emissions generated by 5,500 round trip flights between New York City and Los Angeles.²¹

These estimates alone are certainly consequential but may prove even more impressive given TAGeX's existing and projected growth. The Market for "new" Food Equipment & Supplies was estimated to be \$11.7 billion in revenue in 2021. This market is expected to grow significantly, with forecasts showing approximately \$54 billion in expected revenue by 2030.²² TAGeX is considered the market leader in the Restaurant and Food related "after-market", Labor shortages and low inventory will only exacerbate issues that TAGeX is well-positioned to solve. These trends, combined with the growing use of technology and online marketplaces for resale, rising real estate costs, and general trends towards sustainability in the food and restaurant industries, will allow TAGeX to increasingly facilitate the avoidance of carbon emissions and propel clients towards sustainability wins in the years and decades to come.

Assumptions Clarification

It is also worth explaining the assumptions and potential counterfactuals within this model. We gathered emissions factors for each material in each setting from the Circular Ecology ICE Database and cross referenced these figures with the Defra tool offered by the UK Greenhouse Gas Protocol, as well as the Ecoinvent database (see appendix for links).

There were two key assumptions that have been included in our model:

- **Electronics:** We neglected the energy use of larger, electronically enabled items, as well as the consideration that newer items might be more energy efficient.
- **Life Cycle:** We assumed exactly two life cycles for each item. Often equipment can be used for more than two lifetimes.

This study assumes that these values approximately offset each other. Assuming that energy-enabled items have significant emissions (and that newer items are more energy efficient) may have driven down the total KG CO₂ avoided figure. However, assuming more than two uses for each item would have done exactly the opposite—by orders of magnitude. Each time a piece of equipment is reused, the entire carbon emissions from the item are avoided one more time. For example, a refrigerator repurposed four times saves approximately double the amount of carbon emissions as one repurposed twice.

²¹ [EcoBusinessLinks](#)

²² [Foodservice Equipment and Supplies](#)

Looking Forward/Conclusion

We hope that these stories and calculations will inspire other food industry service providers to make similar decisions and work with TAGeX and comparable reuse facilitators. In particular, we believe the work of TAGeX and peers has the potential to:

1. *Expand the environmental impact and reduce the footprint of food and food adjacent businesses.* As we uncovered, equipment reuse has the ability to curb emissions at significant levels. If more restaurants, grocery stores, university dining halls, and others are able to adopt these practices, the impact could be incredibly consequential.
2. *Expand the impact of these activities into other industries so they too can minimize carbon footprint.* Refurbishing, reuse, and closures do not only exist in the food service industry. This is a concept that could be applied to any setting in which the recycling and warehousing of items might be relevant.
3. *Impact other realms of sustainability: community, labor, equity, and economic growth for small and medium businesses.* As highlighted by clients like Dan Flynn at Yale, the impact goes far beyond carbon emissions. This is a service through which small businesses are able to thrive and employees are able to focus on the most impactful parts of their job.

About the Author:

Alex Gerszten is a food sustainability professional and recent MBA graduate of the MIT Sloan School of Management with a certificate in sustainability. He now works as a Data & Insights Manager for Enveritas, a coffee and cocoa sustainability verification and assurance platform that assists major global coffee and chocolate companies in their international procurement and supply chains, with particular emphasis on developing countries. Alex has also worked with Quantis, a global environmental sustainability consultancy, as well as Cava, the fast-casual Mediterranean chain with over 200 locations in the US. He also has experience as a market research consultant in Washington, DC. Alex holds his BA from Yale University in Political Science and Latin American Studies, and is originally from Boston, Massachusetts.

Appendix

People Interviewed

- Jon Dettling, Global Director of Services and Innovation, Quantis
- Randolph Kirchain, Co-Director, MIT Concrete Sustainability Hub
- Brian Colling, Equipment Category Merchant, Wegmans
- Dan Flynn, Director of Asset Renewal & Planned Projects, Yale Hospitality
- Jeff Chandler, CEO, Hopdoddy

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Inventory, Data, and Calculations

Grocery Stores

Category	Seller	Description	Model #	Serial #	Power	Height	Width	Depth	Weight	kg	Type	Embodied Carbon
Refrigeration		Hill Phoenix Refrigerated Grab & Go Display Case, 8'			120V	43	98	46	400	181.437	Steel	448.148896
Janitorial		BigBelly 885 High Capacity Compactor - Two Units w/Connectors!			Solar Powe	50	51	29	270	122.47	Steel	302.500505
Food Prep		Bizerba SE12 Slicer			120V	24	24	30	10	4.53592	Steel	11.2037224
Beverage		Bunn Coffee Shuttle	TF SERVER, DSG2 1G CD 7-11	TF00491699	N/A	21	9	9	60	27.2155	Steel	67.2223344
Heating and Holding		Cal-Mil Display Case			100-240v	31	21	12	8	3.62874	Steel	8.96297792
Storage		Metal Display Rack				66	37	24	20	9.07184	Aluminum	62.142104
Racking & Shelving		Display Rack Shelf				5	37	22	10	4.53592	Aluminum	31.071052
Food Prep		Cambro bin	12286CW	Unknown	N/A	12	18	6	27	12.247	Plastic	31.2298092
											Total Carbon	962.481401
											Annual Units	750
											Total Carbon Annually	721,861

Large Food Providers (i.e., University Dining Services)

Category	Seller	Description	Model #	Serial #	Power	Height	Width	Depth	Weight	kg	Type	Embodied Carbon
Food Prep		Globe 3975 Commercial Automatic Deli Slicer		397896	115V	24	22	24	187	84.8217	Steel	209.509609
Refrigeration		Fridgelaire Commercial Refrigerator	FCGM201RFB2	WA21203010	120V				311	141.067	Steel	348.435767
Heating & Holding		Hot Hold Display	MD-24-3	100900102	208V				20	9.07184	Aluminum	62.142104
Heating & Holding		Custom Deli 8Ft Heated Deli Display	DILW8CBS5	24812R	120/208v				900	408.233	Steel	1008.33502
Cooking		Holman QCS-2-600H Conveyor Toaster	QCS-2-600H	TQ260A0909A0C	208V 1 Pha	15	15	19	64	29.0299	Steel	71.7038234
Food Prep		National Cart Food Demo Cart							60	27.2155	Aluminum	186.426312
Food Prep		True 4' Prep Table	TSSU-4B-12						420	190.509	Steel	470.556341
Storage		Metro Rack w/Basket Shelves				72	36	18	49	22.226	Aluminum	152.248155
Material Handling		Equipment Stand							50	22.6796	Plastic	57.83298
Beverage		Crathco Ltd Cold Beverage Dispenser	D25-3	T331308	115V, 60Hz	14	17	11	77	34.9266	Aluminum	239.2471
Work Tables		Work Table - Stainless				35	73	25	130	58.967	Steel	145.648391
											Total Carbon	2952.0856
											Annual Units	600
											Total Carbon Annually	1,771,251

Restaurants

Category	Seller	Description	Model #	Serial #	Power	Height	Width	Depth	Weight	kg	Type	Embodied Carbon
Cooking		Panasonic Microwave							25.5	11.5666	Steel	28.5694921
Refrigeration		Beverage Air Two Door Refrigerator	KR48-1AS	215733	115V	84	55	31	245	111.13	Steel	274.491199
Cooking		Southbend Six Burner Range With Oven				60	37	34	535	242.672	Steel	599.399148
Cooking		Bakers Pride Convection Oven	4558COGN1	5.55031E+11	120V	64	40	40	1130	512.559	Steel	1266.02063
Refrigeration		Hoshizaki Ice Machine				70	31	33	410	185.973	Steel	459.352618
Cooking		Pitco 3 Vat Fryer		006IE040527	120V	48	47	36	765	346.998	Steel	857.084764
Sinks		Two Bay Sink				35	96	30	113	51.2559	Steel	126.602063
Food Prep		Stainless Steel Prep Table				40	72	29	130	58.967	Steel	145.648391
Furniture		Wood Tables				36	66	30	50	22.6796	Wood	13.154168
Seating		Table Top Chairs				34	18	22	20	9.07184	Wood	5.2616672
Racking & Shelving		3 Tier Metro Shelf				76	35	24	20	9.07184	Aluminum	62.142104
											Total Carbon	3837.72625
											Annual Units	1800
											Total Carbon Annually	6,907,907

Carbon Emissions Factors

Type	Embodied Carbon - kgCO2e/kg
Steel	2.47
Wood	0.58
Aluminum	6.85
Plastic	2.55

Note: Steel, Wood, and Aluminum factors gathered from [Circular Ecology ICE Database](#). Plastic factor gathered from average produced by [Columbia University Coalition on Materials Emissions Transparency Report](#). Data Cross referenced with [UK GHG Protocol's Defra Tool](#) and the [Ecoinvent Database](#).