

Plastic Reduction Case Studies

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Executive Summary

Plastic is as one of the most common and convenient materials in modern society. The use of plastic is increasingly controversial, however, because of its negative impacts on the environment, biodiversity, and human health. Plastic does not naturally biodegrade in the environment. Instead, it breaks down into small particles (micro-plastics) that can negatively impact human health by releasing toxins into the food chain and by poisoning wildlife and marine life. As awareness of the harm of plastic products increases, companies are searching for efficient and low-cost ways to reduce their use of plastic. Nevertheless, plastic reduction is challenging in many industries, especially when plastic products are an important part of their daily services. Though facing difficulties, companies and organizations have taken steps to reduce plastic consumption. Companies that have developed effective plastic reduction practices can serve as examples for peers in the same industries. Two particularly plastic-intensive industries are hotels and restaurants. Leaders in these sectors have developed innovative approaches to reduce, recycle, and reuse the plastic consumed during their operations. This project investigates the current plastic reduction practices among such leaders in the restaurant and hotel industries, and provides practical strategies for the improvement of sustainability performance in these and related business sectors.

We begin by reviewing the literature regarding the use of plastic, the environmental impacts of plastic products, the plastic reduction practices in industrial sectors, and the future forecasts about plastic consumption. We also summarize the regulation of plastic pollution through

legislation in the US. To collect information on plastic usage and reduction practices in selected restaurant and hotel companies, we conducted phone interviews, online research, and online surveys. The information was used to characterize each company's basic operation, plastic usage, plastic reduction initiatives, and motivations for promoting plastic reduction and sustainability.

Based on the information collected, we developed individual case studies for five restaurants and five hotels. Each of the case studies highlights the company's sustainability motivation and values, as well as their efforts, achievements, and challenges in plastic reduction.

Based on the case studies and additional research, we present a summary of common effective strategies for plastic usage management and reduction in the hotel and restaurant sectors.

While all of our sample companies have achieved notable successes, they all encounter significant challenges, such as the relatively high costs of replacement of plastic products, inconsistent regulations, and, particularly in small companies, the difficulty of developing a tracking system. Summarizing our findings, we describe a wide range of strategies, large and small, to reduce plastic use and manage plastic waste that are applicable to diverse business sectors. The most important of these are attention and knowledge. We found that when company leaders consider it a priority to reduce plastic consumption, they can often develop practical approaches that benefit not only their company but also the environment and society at large.

This report makes several recommendations for plastic reduction for wide usage:

For restaurants:

- Reduce the use of plastic that is passed on to customers by using biodegradable or recyclable materials for to-go cups, replacing take-out plastic containers with glass ones and encouraging customers to return the containers, minimizing unnecessary packaging for take-away food, and limiting take-away services
- Replace in-house plastic products with alternatives made from other materials, such as metal, paper, glass, wooden, recycled brown butcher paper, etc.
- Recycle plastic products by participating in local recycling programs, or conducting in-store recycling
- Change consumers' behavior to reduce plastic usage and encourage recycling and reuse of plastic products by providing financial incentives, or provide reusable plastic containers that are not as expensive as the common ones that consumers need to buy
- Encourage suppliers to conduct similar actions (e.g. choose products that come with less or even no packaging and products that are packaged in more sustainable ways, encourage suppliers to reuse or recycle used plastic products, reuse the plastic products from suppliers) to reduce their plastic, decreasing the upstream plastic use, and set up selection criteria in terms of plastic usage for suppliers
- Engage staff in initiatives by staff education and training, and generate positions such as sustainability coordinator or manager to manage the system

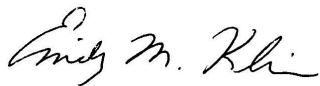
- Implement information disclosure through corporate sustainability reports, websites, emails, posters, and menus
- Conduct research on life cycle environmental impacts of different potential materials that can replace plastic
- Initiate plastic data tracking and consistent policy enforcement
- Cooperate with social groups, including non-governmental organizations, government programs, high technology companies, competitors, and industry associations to identify more opportunities of plastic reduction, earn support for initiatives, reduce the costs of initiatives, and mitigate risks of plastic waste

For hotels:

- Establish plastic waste management system, by creating initial baseline waste inventories, collecting data of current plastic usage amount, identifying hotspot, producing template for annual analysis, and building a sustainability position or a team
- Replace single-use plastics, by providing guests reusable and refillable tools instead of single-use plastic products
- Educate and encourage customers to reduce plastic use, by providing guests what they need to opt out the unsustainable options, and building new distribution system for the usage of plastic products in hotels
- Recycle used plastic products through providing recycling bins and information about local recycling practices in stores and public spaces

- Implement staff training through providing training materials with facts and numbers on plastic consumption and waste generation and having staff complete plastic audit
- Preserve historic architecture and reuse materials to avoid plastic waste generation during the process of renovation and rebuilding
- Enact responsible sourcing policy in hotels, including creating sourcing profile for suppliers and establishing consistent sourcing criteria based on local standard and sustainability standard
- Share information and communicate plastic reduction efforts to guests and investors, through visualizing plastic waste data, generating marketing flyers, and so forth
- Build partnerships with industry competitors, or with other industries, to close the loop and reduce plastic usage in operations
- Advertise concepts of “green hotels” including initiatives of plastic reduction, waste management, and other sustainability practices to attract customers who recognize the values and strengthen cooperation with comprehensive stakeholders

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Abstract

Plastic is one of the most commonly-used and convenient materials in most societies around the world. The use of plastic is increasingly controversial (CHF, 2015), however, due to its negative impacts on the environment, biodiversity, and human health. Two particularly plastic-intensive industries, hotels and restaurants, have initiated efforts to reduce, recycle, and reuse plastic in their operations. This project aims to investigate current plastic reduction practices in the restaurant and hotel industries, and to provide practical strategy suggestions for the improvement of sustainability performance in these and related business sectors. Focusing on the practices of five partner restaurants and five partner hotels, we collected information through phone interviews, an online survey, and online research. This revealed each company's basic operation, plastic usage, plastic reduction initiatives, and motivations to promote plastic sustainability. We found that although the sample companies have adopted initiatives to reduce plastic and have achieved some success, all of them encounter significant challenges. In addition, there are differences between the hotel and restaurant sectors, as well as among different companies within each sector, in terms of the scales, types, and motivations for plastic reduction. Synthesizing the information we collected, we provide several practical strategies and recommendations for the restaurant and hotel industries to develop plastic reduction practices, and to communicate their initiatives, progress, and performance to the public. For example, we advise that restaurants and hotels cooperate with non-governmental organizations, government programs, and high-tech companies to gain additional support for their plastic pollution reduction initiatives. In addition, it might be an effective strategy to

provide financial incentives to change consumers' behavior of plastic usage. Other suggested strategies include material replacement, recycling and reuse, educating staff to improve the employee engagement, and cooperating with responsible suppliers. This initial study can be expanded in the future to include more sample companies in these two industries, as well as other plastic-intensive industries, such as airline companies and supermarket stores.

Introduction

The first man-made plastic was invented by Alexander Parkes, a British metallurgist, in 1862, and the result was publicly displayed at Great International Exhibition in London (Bellis, n.d.). Based on previous research, in 1907, Leo Hendrik Baekeland invented the first fully synthetic resin, called Bakelite, which experienced commercial success (Bellis, n.d.). The plastic industry greatly expanded during World War II, and continued thereafter (CHF, 2010). In the modern world, plastic use is ubiquitous. Plastic is now the material of choice used in numerous products that were previously fabricated from metal, glass, wood, or materials derived from plants and animals (e.g., cotton and wool). It is undeniable that plastic brings convenience to human life due to its versatility, durability, and low cost, and plastic is therefore popular among both manufacturers and consumers.

However, our understanding of the numerous negative impacts of using plastics has been growing. In her famous 1962 novel, *Silent Spring*, Rachel Carson pointed out the danger of chemical pesticides, and drew attention to the ways humans detrimentally impact the environment. In the 1960's and 1970's, scientists began to raise alarms about the effects of plastic debris in the oceans (Colton et al., 1974). Plastic degrades extremely slowly under typical environmental conditions; depending on the type of plastic, it may take 50 years or more for plastics to degrade in nature (Müller, 1998). In addition to producing debris pollution, plastic degradation may impact human, as well as terrestrial and marine life, by releasing toxins into the food chain (Andrews, 2012). Each year, about 300 million tons of plastic is generated

globally, and it is estimated that 10 to 20 million tons end up in the oceans (UNEP, 2014). Of all the plastic produced, only a small part is recovered for recycling; in 2012, the recovery rate of plastic generation in the United States was estimated to 9% (US EPA, 2014a).

As awareness of the harm of plastic products rises, companies are searching for efficient and economical ways to reduce their use of plastic. Nevertheless, plastic reduction is challenging in many industries, especially in sectors where plastic products are used daily as an important part of their services. Though they face difficulties, some companies and organizations have taken significant steps to implement plastic reduction practices, serving as examples for peers in the same or similar industries. Working with our client, Plastic Pollution Coalition, we sought to evaluate current practices in plastic reduction in two specific service industry sectors: restaurants and hotels.

This report begins with a review of the literature regarding the use of plastic, the environmental impacts of plastic products, and plastic reduction practices in commercial sectors. We then present the methodology used to collect information from companies in selected industries. This is followed by a presentation of our results in the form of case studies for companies within each sector. Each case study includes a description of the company's activities with respect to sustainability in general, their motivations in adopting sustainable practices, their specific initiatives in terms of plastic reduction, as well as challenges they are facing. In our discussion section, we analyze these case studies and make recommendations to help similar businesses reduce their plastic footprint in effective and cost-efficient ways. Finally, we provide a summary and recommend additional work to improve this type of study in the future.

Literature Review

US plastic budget

Information made publicly available by the US Environmental Protection Agency (US EPA) includes data on the consumption patterns of plastic. According to the US EPA, plastic waste has dramatically increased in the United States since 1960 “when plastics were less than one percent of the waste stream” (US EPA, 2014b). It is estimated that 8% of global crude oil production is used to produce plastics (Hopewell et al., 2015). Furthermore, about half of the annual plastic produced is used for the creation of single-use or disposable items (Hopewell et al., 2015). However, the durability of plastic makes single-use or disposable items an increasing environmental threat because such a “high resistance to aging and minimal biological degradation” can lead to long-term problems (Moore, 2008).

One problem with plastics is the stress on the solid waste stream management (Chen, 2014). In the US alone, 88,000 tons of plastic is discarded daily; however, waste management systems cannot handle this amount and plastic waste escapes into the environment (Sachs, 2014). In 2012, the US EPA estimates that the United States is responsible for about 32 million tons of plastic waste (US EPA, 2014). Of the plastic waste generated annually, less than 10% is recycled or recovered, and therefore the vast majority of plastic ends up in landfills (US EPA, 2014).

At every step along the waste management stream, leakage and loss of plastics occurs. Because consumption is increasing exponentially while waste management infrastructure development

is stagnant, new solutions to plastic waste management are necessary (Merkl, 2014). Even with the estimates of just 0.1% of annual plastic waste escaping the waste management system, these thousands of tons of plastic pollution have serious environmental and public health implications (Cozar et al., 2014).

Damages of plastic pollution

Most of the peer reviewed literature on plastic pollution focuses on understanding and measuring the environmental and public health issues associated with plastic debris, both on land and in the ocean.

Much attention has focused on plastic pollution in the marine environment. Recent estimates conclude that there are more than 268,940 tons of plastic in the marine environment, and roughly 5.25 trillion plastic particles floating in the ocean (Eriksen et al., 2014). The literature clarified that plastic waste make up the most share in all marine litter (Derraik, 2002). As a public health, environmental health, and navigational hazard, the damages of plastic pollution in the marine environment have increased over time (Moore, 2008). The Marine Debris Working Group of the National Center for Ecological Analysis concluded that plastic pollution poses a threat to public health when persistent bioaccumulative and toxic substances (PBTs) adsorb to small plastic pieces and microplastics in the ocean (Lavender Law & Thompson, 2014). While not all chemicals that adsorb onto plastics will bio-accumulate, some are potentially capable of expanding to the food chain, such as organic compounds and heavy metals that are harmful to humans (Lavender Law & Thompson, 2014).

Plastics in the ocean often break into smaller pieces (microplastics) and these particles can get caught in the gills of fish or ingested by marine life, resulting in suffocation or starvation of the organism (Moore, 2008). Crossing all environmental scales, plastic pollution poses a threat, locally and globally, to marine and wildlife ranging from microorganisms to marine megafauna (Moore, 2008).

Parallel to the marine environmental damages, the terrestrial impacts are often related to wildlife interactions - ingestion and entanglement (EarthTalk, 2008). It is important to note that there is very little peer reviewed literature specifically highlighting the environmental and public health impacts of plastic pollution on land. The focus on marine plastic pollution comes from the likelihood that the plastic pollution will eventually travel downstream to the ocean (EarthTalk, 2008). The United Nations Joint Group of Experts on the Scientific Aspects of Marine Pollution found that 80% of marine debris (not just plastic pollution) originates from land-based sources (UNEP and Greenpeace, 2014).

In addition to posing a navigational hazard, large amounts of plastic pollution in waterways, in stormwater drains, and on roadways can interfere with industries such as shipping, trucking, fishing, and tourism (Derraik, 2002). Economic interference is the number one driver for the creation of legislation regulating plastic pollution in the US (Derraik, 2002).

Legislation

While the US EPA regulates plastic pollution through various laws and regulations, the Marine Plastic Pollution Research and Control Act of 1987 authorizes the US EPA, US NOAA, and the US

Coast Guard to work together for understanding the impacts of plastic pollution specifically (US EPA, 2014). While all 50 states have individual waste management laws - including Litter Laws, enforceability is an obstacle at the state and federal levels when trying to regulate the amount of pollution entering the environment because of traceability and often lack of culpability (Subramanian, 2000). The small fraction of plastic waste that becomes pollution makes it difficult to regulate and manage plastic generally, because different products have different life cycles, such as plastic bags and plastic straws (Derraik, 2002).

Plastic Reduction Initiatives

Reductions in the generation of new plastic are likely to provide the biggest environmental impact because cleanup is not efficient, in terms of time and money (Subramanian, 2000). With a 4% annual increase in global plastic production over the last 3 years, global plastic waste generation is expected to increase at a similar rate (Gourmelon, 2015). The consumption of plastic items does not necessarily mean that those items will end up in the oceans or the terrestrial environment; however, consuming more plastic increases the probability of increased plastic pollution.

In this context, the goal of this project is to highlight positive business practices focused on reducing plastic consumption in two business sectors: hotels and restaurants.

Plastic reduction initiatives are often aimed at the individual consumer (My Plastic Freetime, 2015; Life without Plastic, 2015; Zero Waste Home, n.d.). But scaling up from the individual can achieve even greater reductions (UNEP, 2014). The UNEP and the Global Partnership on Marine

Litter argue that disclosing plastic use and the cost of plastic use in the consumer goods industry “can unlock previously unrecognized benefits. Such benefits are often good for business, for example, saving input costs and recovering value from waste; customer loyalty, such as preferred products and enhanced brand value; employee engagement; community satisfaction, and improved access to capital” (UNEP, 2014). It is possible for the same to hold true for businesses in service industries that consume plastic in the service of their customers. Identifying, disclosing, and valuing plastic use creates opportunities for innovation and reduction (UNEP, 2014).

Labeled as the most important of the three R’s, reduction is the first step in solid waste management, followed by reuse and recycling. Because reduction happens prior to the initial point of consumption, reduction is the most effective waste management technique (Plastic Waste Solutions, 2012). Therefore, the goal of our case studies is to focus on reduction practices, although other solid waste management techniques related to reusing and recycling plastics are highlighted. Recycling efficiency is close to 9% in the United States, by some estimates, so although recycling is often touted on sustainability websites, more actions are needed (Plasticity, 2014). *A priori*, awareness is the first step in a reduction practice, so businesses can make informed decisions.

The shift from consumer-focused decisions to business-focused decisions in the trend of plastic consumption awareness campaigns is highlighted by the growth in participation at the 3rd Annual Plasticity Forum (Plasticity, 2014). Stated as the mission of The Plasticity Forum, “the

goal is to have a world where plastic is used, but without creating a plastic footprint on our communities” (Plasticity, 2014).

Challenges: Lack of Disclosure

In contrast to the valuation of reduction practices of performed by the UNEP, in the consumer goods industry, reduction of plastic in the service industry may be easier because there are likely alternatives that do not alter the ability to provide a service. Various business forums, such as GreenBiz, Green Plus, and SustainableBusiness.com, exist to highlight and promote sustainable business practices within different industries, but these websites are broad in nature, so we will focus on practices and challenges in the restaurant and hotel industries.

On the global stage, the Plastic Disclosure Project (Plastic Disclosure Project, 2014) is one of the prominent advocates for making changes in the way businesses measure, disclose, and thus verifiably reduce their plastic footprints (UNEP, 2014). The value and cost of plastic is hard to quantify, especially in the service industry, given that the consumer’s focus is on the quality of the service provided, rather than on the act of consuming the plastic good (UNEP, 2014). The measurement of economic value, or willingness to pay, for plastic items in the service industry has not been established (UNEP, 2014). Without information on how other businesses are operating or reducing their plastic footprint, many of the best business practices are still developing on a situational or individual company basis.

Methodology

To obtain information on plastic usage and reduction initiatives, we conducted online surveys and phone interviews with targeted businesses, and online research on the business and industries. Based on the business contacts provided by our client, the Plastic Pollution Coalition, we reached out to a range of companies and organizations to explore their practices with respect to plastic use and reduction. The companies and organizations include restaurants, hotels, a winery, a studio, and other companies (see Table 1 in Appendix).

We developed an online survey (see Table 2 in Appendix) to gain the following information of each company (see specific survey questions in the Appendix):

- Background information of the company;
- Plastic usage;
- Plastic waste reduction initiatives;
- Value and motivations for sustainability activities.

Based on the initial information collected, we chose to focus on practices within two specific business sectors: the restaurant and hotel industries. We therefore supplemented our initial contact list with companies within these industries, and sought out businesses regarded as leaders regarding sustainability.

Table 1 shows the ten companies targeted, representing five each in the restaurant and hotel industries.

Table 1. Study methods for each target business

Organization Name	Research Methods
Restaurants	
The Grey Plume	Phone interview and online research
Snappy Salads	Phone interview and online research
Ted's Montana grill	Online survey and online research
Chez Panisse Restaurant	Online survey and online research
Starbucks Corporation	Phone interview and online research
Hotels	
Inn at Laguna Beach	Online survey, phone interview, and online research
Proximity Hotel	Phone interview and online research
Rancho La Puerta	Phone interview and online research
The King's Daughters Inn	Phone interview and online research
Hotel Andaluz	Phone interview and online research

Based on the responses obtained from online surveys, we conducted phone interviews with most companies to delve further into their practices and motivations. After collecting related information, such as plastic consumption rate, plastic products' costs, and progress of reduction initiatives, we summarized as case studies their practices, performance, and motivation to

reduce plastic use. In addition, we conducted online and peer-review research to explore “best practices” in each industry.

Case Studies

Restaurants

The Grey Plume

Website: <http://www.thegreyplume.com>

The Grey Plume was the first Green Restaurant Association 4-Star Sustainabuild™ restaurant in the country (Green Restaurant Association, n.d.; The Grey Plume, n.d.), incorporating sustainable practices in diverse aspects of its operations, including plastic waste management.

A. Introduction

The Grey Plume, located in Omaha, NE, features a seasonal-driven, American-style menu, based largely on locally sourced meats and produce (The Grey Plume, 2015a). Opened in 2010 by chefs Clayton Chapman and Michael Howe, the restaurant incorporates sustainable approaches throughout its operations. For instance, the restaurant uses recycled barn wood flooring in its dining area and bar, and prints its menus on recycled paper with soy-based ink (The Grey Plume, 2015b). As one of Nebraska's first restaurants to incorporate sustainable practices into its mission, the Grey Plume has been described as the "Nation's Greenest Restaurant" (Spencer, 2012) and the "Nation's Most Sustainable Restaurant" (Markel, 2015).

B. Motivation and values

In addition to providing superior food and service, owners of The Grey Plume are motivated by their sense of social responsibility, especially with respect to environmental sustainability. The owner and executive chef of the Grey Plume, Clayton Chapman, said: “we are constantly looking at what we are doing and asking how we can better our environmental consciousness” (Clem-McClaren, 2012). The staff of the Grey Plume are motivated by his passion; they continually look for ways to better their surroundings, and they would like to learn how to incorporate these actions into their daily lives, as well as how to encourage their families, friends, suppliers and customers to do the same (personal communication with Rachel Patel, General Manager of The Grey Plume, February, 2015).

C. Plastic reduction initiatives

In terms of plastic reduction, the Grey Plume has initiated recycling programs for its plastic products, used reusable and compostable materials for plastic products, and replaced plastic products with alternatives. In particular, the following actions related to plastic reduction are included in their Green Restaurant Association Certification Report (The Grey Plume, n.d.).

- Recycling: Commingled (Plastics, Glass, Aluminum)
- Returnable Packaging
- Reusable Bag Program
- Reusable Container Program
- Bio-based Take-out containers
- Paper Bags

1) Environmental actions regarding to-go containers

Only about 2% of customers order food to go at The Grey Plume. Nevertheless, their to-go boxes are made from materials that are 100% recyclable and compostable, manufactured by the company Rosseto¹. The Grey Plume also uses paper bags rather than plastic bags for packaging. In addition, they use recyclable plastic straws for people that take drinks to go. They also encourage their customers to bring their own containers by providing a 10% discount to those who do so. The Grey Plume also encourages their patrons to return the containers for reuse, paying \$1 for each returned glass jar.

2) Alternatives to replace plastic use

In the dining area, the Grey Plume uses glass or ceramic cups and plates instead of single-use plastic containers so that they can be cleaned and reused. The Grey Plume is also trying to find more affordable and reliable alternatives for plastic trash bags; however, they have been unable to identify a viable alternative to plastic trash bags to date.

3) Relationship with suppliers and customers

Many local farmers are suppliers for The Grey Plume. If the farmers provide produce or meats in containers made from glass or other materials that are reusable, The Grey Plume returns the containers to the farmers. For instance, The Grey Plume returns the egg crates to its egg

¹ Rosseto compostable cutlery are sold on Amazon, <http://www.amazon.com/Rosseto-Liteware-Compostable-Cutlery-Pieces/dp/B003NE5AFA>

suppliers for reusing. They are trying to influence their suppliers to take similar actions for the purpose of environmental protection.

To communicate with their customers, The Grey Plume displays various aspects of their sustainable practices in their restaurant. For instance, they display their sustainability certificates in the restaurant. In addition, they participate in a number of community organizations, including Green Omaha Coalition and Omaha Biofuels Coop (personal communication with Rachel Patel, General Manager of The Grey Plume, February, 2015).

D. Challenges

According to Rachel Patel, general manager of The Grey Plume, the biggest challenge they are facing is the balance between plastic reduction and commercial considerations. In particular, reusable alternatives usually cost more than traditional plastic products; how to incorporate these costs into their business model is currently under evaluation and analysis by the Grey Plume (personal communication with Rachel Patel, March, 2015).

Snappy Salads

Website: <http://www.snappysalads.com>

Snappy Salads is a restaurant chain based in Texas, with seven restaurants. In 2007, they were selected as “the Sustainable Business” by the Greater DFW Recycling Alliance (Dahlander, 2010).

A. Introduction

Based in Texas, Snappy Salads owns seven restaurants serving mainly salads to customers.

Founded in 2006, Snappy Salads has adopted various sustainable practices, including recycling their compact fluorescent light bulbs (CFLs) and batteries and using renewable resources for their take-away containers. In 2007, they were selected as a “Sustainable Business” by the Greater DFW Recycling Alliance (Dahlander, 2010), and in 2010, Snappy Salads was one of two restaurants awarded the Green Business Certification by the city of Plano. In addition, recognizing their contribution to the community, the Texas Restaurant Association honored them with “Restaurant Neighbor Award” in 2010 (Snappy Salads, 2014).

B. Motivation and values

The founder and CEO of Snappy Salads, Chris Dahlander, is inspired to help protect the environment, and has made numerous efforts to realize this goal. “Simply put, it’s just something that I passionately believe in. I want to leave this world a little better than the way I found it. I serve fresh, healthy food in environmentally friendly surroundings by passionate folks who have an opportunity to improve their lives,” he said (Cook, 2014). “It’s easy to make a buck. It’s a lot tougher to make a difference.”

C. Plastic reduction initiatives

In terms of plastic reduction, Snappy Salads replaced their plastic products with sustainable alternatives. About 35% of their customers purchase take-away food, and they have replaced

single-use plastic containers with reusable materials. Particular actions taken by Snappy Salads include:

- Use to-go cups that are made from corn products
- Use compostable materials for to-go food containers
- Replace plastic products in store with non-plastic materials
- Starting to use paper straws
- Replace plastic bags with paper bags for to-go food

1) Change to biodegradable materials

Snappy Salads is working to reduce their dependence on plastic products. As for take-away food, they use cups made from corn, which is degradable and renewable. Furthermore, they turned to compostable options for utensils, such as forks and knives, and they use paper bags for their take-away food packages. As a result, almost all of their to-go products are now made of biodegradable materials. As for in-store service, almost none of the products used is plastic. For instance, they use metal bowls for salads and glass cups for drinks (personal communication with Chris Dahlander, the founder and CEO of Snappy Salads, January, 2015).

It is estimated that Snappy Salads used about 27,000 straws per month in its seven restaurants (Cook, 2014). Recently, they started to use paper straws. The straws are offered by Aardvark² Straws. According to their website, Aardvark straws are the only FDA-approved, eco-friendly

² Official website of Aardvark: <http://www.aardvarkstraws.com>

paper straws that are totally made in the U.S. Chris Dahlander stated that most customers love this idea (personal communication with Chris Dahlander, January, 2015).

2) Relationship with suppliers and communication with customers

While Snappy Salads has control over products passed onto their consumers, they do not have much control over the practices of some of their necessary suppliers and manufacturers. For example, they order a great deal of ice, which comes in plastic bags. They say that the best they can do at this point is to recycle the plastic from their suppliers.

Snappy Salads puts some of the information about their sustainable and plastic reduction practices online and on site. They also believe that through their products, their customers come to understand their company's environmentally friendly approaches and intents, and appreciate and support their actions.

3) Uniform standards for all restaurants

Snappy Salads has seven restaurants in different locations throughout Texas. Among the seven restaurants, they use the same standards for their materials regarding plastic reduction, and source their products from the same producers and manufacturers for their non-plastic products. Based on the number of their restaurants, uniform standards help Snappy Salads achieve a wider impact. In addition, consistency within their restaurants increases the efficiency of plastic management.

D. Challenges

There are three main challenges that Snappy Salads is facing. The first is the price of alternatives to plastic, as they are generally more expensive than plastics. The second is the availability of recycling programs in the area. Snappy Salads receives various supplies that are packaged in plastic, and the packaging has to be thrown away into regular trash since their locations provide limited recycling services. The third challenge is some resistance from the public (guests and team members) to change their actions. Though they have tried to educate their customers, there are still a certain number who appear to be indifferent to plastic reduction (personal communication with Chris Dahlander, March, 2015).

Ted's Montana Grill

Website: <https://www.tedsmontanagrill.com>

Ted's Montana Grill, founded in 2002, has adopted the motto "Eat Great. Do Good" to emphasize its goal to merge superior dining with sound environmental approaches. The company is committed to using environmentally sustainable practices in all of its activities (Ted's Montana Grill, 2014).

A. Introduction

Ted's Montana Grill is a chain of restaurants located in 17 states³, serving mainly bison as a popular menu choice (Ted's Montana Grill, n.d.). Its first restaurant opened in Columbus, Ohio, in January 2002. Ted's Montana Grill is inspired by its co-founders, Ted Turner and George W. McKerrow, to focus on environmental sustainability. In order to improve its environmental performance, they have focused on several fronts including energy efficiency, water conservation and waste reduction. In 2013, Ted's Montana Grill recycled more than 350 tons of recyclable materials (Ted's Montana Grill, 2014).

B. Motivation and values

To express their intent to balance economic profit and social responsibilities, Paula Owens, Ted's Purchasing and Sustainability Manager, said: "ultimately a company is in business to make a profit, but we believe strongly you can build a successful business while still preserving the natural world around us. We take environmental considerations into every decision we make. We are committed to acting responsibly, preserving what we can, and helping to raise consciousness concerning the health of our planet" (personal communication with Paula Owens, February, 2015).

In their sustainability report, the co-founders expressed their understanding of environmental protection. Ted Turner, Co-founder and Chairman of Ted's Montana Grill, said: "I'm an environmentalist and have been for my whole life, since I was a little boy. It makes good business sense and it's the right thing to do for the planet and the people on it" (Ted's Montana

³ Ted's Montana Grill operates restaurants in New York, Virginia, North Carolina, Montana, Colorado, Illinois, Indiana, Ohio, Pennsylvania, Massachusetts, Connecticut, Rhode Island, Kentucky, Virginia, Tennessee, Georgia, and Florida.

Grill, 2014). George W. McKerrow, Co-founder and CEO, said that “We know we’re only a small part of the solution, but we’re committed to acting responsibly, preserving what we can, and helping to raise consciousness concerning the health of our planet” (Ted’s Montana Grill, 2014).

C. Plastic reduction initiatives

In terms of plastic reduction, Ted’s aims to be 100% plastic-free, and currently, they have eliminated 97% plastics that are not related to supplier packaging (personal communication with Paula Owens, February, 2015). In particular, the following actions have been taken (Ted’s Montana Grill, 2014):

- Print on recyclable paper
- Use straws that are made from eco-friendly polymer coated paper
- Use stir sticks that are made from wood rather than industry-standard plastic
- Cover tables with recycled brown butcher paper
- Use to-go cups made from corn materials that are 100% compostable
- Use to-go cutlery kits made from corn and tapioca that are biodegradable and compostable
- Recycle materials that are used in house, such as glass, plastic, paper, and metal, in 29 of all the Ted’s Montana Grill restaurants

1) Sustainability functions and reports

In 2013, Ted’s created the Sustainability Manager position. Their sustainability department works with their purchasing department, as well as with their Green Team and Executive Team,

to achieve their sustainability goals. In addition, in 2013, they developed a Sustainability Story (Ted's Montana Grill, 2014), a document introducing Ted's sustainability aims and achievements with respect to the planet, plate, and people. In this case, "Plate" refers to managing the quality and content of their menu. Ted's intends to renew the Sustainability Story every 2-5 years to measure their environmental performance and plan for the future. To communicate with their customers about their green actions, Ted's uses the tools of its Sustainability Story, website, social media, email newsletters, and employee conversation with guests (personal communication with Paula Owens, February, 2015).

2) Reduce plastic use in restaurants

Ted's has made great progress in reducing its plastic use both for on-site dining and for take-away containers. Currently, their major continued use of plastic within their restaurants is for plastic wrap. They have established the following guidelines for plastic use: 1) Avoid bringing in any plastic that is from supplier packaging; 2) Plastic used must be from recycled plastic source material; 3) Plastic used must also be reusable by guests, or recyclable in most municipalities (personal communication with Paula Owens, February, 2015).

3) Develop selection criteria for suppliers

Supplier packaging remains a challenge, and they have set criteria for their suppliers and products to reduce their plastic use. To choose suppliers, they research their suppliers' sustainability efforts and practices to ensure their philosophy is closely aligned with Ted's. In particular, Ted's is looking for measurable results in water and energy conservation, and

recycling efforts within the supplier's plans. In addition, they are working with vendor partners to seek out new and more sustainable packaging materials to replace plastic. For instance, cardboard lined with sustainable materials may be a potential alternative for plastic in some cases, and they are in the process of evaluating the material.

4) To-go containers

At Ted's, few plastic products are passed to their customers. According to their data, only 3% of plastic waste consists of take-away materials, i.e. part of their to-go soup cups/lids (personal communication with Paula Owens, February, 2015). As for other take-away containers, they have replaced some of their to-go containers with biodegradable and compostable materials. For example, their to-go cups and cutlery kits are mostly made from corn materials that are 100% compostable. In addition, Ted's has begun using wax-coated paper straws. Indeed, this has promoted the new demand for the use of eco-friendly straws in other industries (Ted's Montana Grill, 2013).

5) Plastic waste management

Since most of their plastic waste (about 97%) is produced within their restaurants, Ted's has worked to mitigate the impact of their plastic waste. Recycling plays a prominent role in these efforts. Most of their plastic products are recycled as single stream (co-mingled), and they have service providers in all locations to meet their recycling standards. In addition, they are working with third-party providers to obtain financial information, such as costs per week or per month of recycling, reusing or disposing of plastic waste.

D. Challenges

As Ted's operates over 40 restaurants in 17 states, Ted's faces the challenge of regulation differences between the states. In particular, each state, or even counties within a state, might have different regulations or standards regarding plastic recycling, as well as landlord and municipality restrictions. Ted's works to understand the types of plastics that are recyclable in specific areas and to manage the restaurants accordingly.

In addition, it is challenging for Ted's to coordinate with suppliers regarding plastic reduction for packaging. As mentioned above, to address this problem, Ted's is trying to set strict criteria for its suppliers to better influence them.

An interesting challenge comes from the use of high-density 5 gallon buckets. Ted's lacks the confidence that the buckets will actually be recycled. To address this, Ted's is working with other organizations and companies develop possible solutions. For instance, Ted's is donating the pickle buckets to Captain Planet Foundation to reuse the buckets in gardens in local schools. In addition, they are partnering with one of their suppliers to reuse the buckets as water containers or for some other purposes in developing regions (personal communication with Paula Owens, March, 2015).

Chez Panisse Restaurant

Website: <http://www.chezpanisse.com/>

Famous for organic, locally-grown ingredients and food sustainability, Chez Panisse restaurant was awarded among the World's 50 Best Restaurants from 2004 to 2007 (theworlds50best, 2015). Focusing on environmental harmony in addition to innovative delicious food, Chez Panisse has integrated plastic waste management into their sustainable food philosophy, and has limited the usage of plastic to very low levels by adopting practical initiatives.

A. Introduction

Chez Panisse, located in Berkeley, CA, was founded in 1971 by chef, author, and activist Alice Waters and a group of her friends (Chez Panisse, 2015). Credited with inspiring the California cuisine movement, the restaurant features a locally sourced and daily changing seasonal menu. Waters believes that “the best-tasting food is organically and locally grown and harvested in ways that are ecologically sound by people who are taking care of the land for future generations” (Chez Panisse, 2015).

B. Motivation and values

Alice Waters is emphatic in her view that “social responsibility trumps financial costs” (personal communication with Alice Waters, February, 2015). She notes further that they “feel lucky to have many more sustainable products that are also increasingly affordable and effective on the market these days” (personal communication with Alice Waters, February, 2015). Building on the philosophy of sustainable food, Alice Water established the Chez Panisse Foundation to launch the Edible Schoolyard Project (ESP), an education-focused program that “uses food to nurture, educate and empower youth” (Chez Panisee, 2015). The mission of “edible education

curriculum”, the vision of “interactive classrooms”, and the goal to provide students with a “free, nutritious, organic lunch” all reflect Chez Panisse’s passions for food sustainability and social responsibility (Chez Panisse, 2015).

C. Plastic reduction initiatives

Regarding plastic usage reduction and control, Chez Panisse has:

- Limited plastic usage to only plastic wrap
- Named a sustainability coordinator
- Provided no take-away service
- Tried plastic substitutions in operations
- Used recycled plastic products
- Collaborated with suppliers

1) Sustainability organization and tracking system

Chez Panisse identifies a specific coordinator to coordinate and manage sustainability practices in the restaurant. However, they do not produce an annual sustainability report or similar self-evaluation to track and communicate their sustainability practices.

2) Plastic control, replacement, and recycling

In regards of plastic usage and reduction, the primary plastic used in Chez Panisse is limited to plastic wrap for food storage. They provide no take-away service, so they pass no plastic waste on to their consumers. They have also tried various sustainable plastic wrap substitutes, but

based on their experience, nothing works as well as plastic wrap. Although they do not track how much plastic they consume, they estimate that they spend about \$40 per week on plastic wrap. Because the costs and the amounts of wrap used are relatively low, they are not particularly worried about the problem of plastic consumption. In daily operations, their other plastic usage is large plastic jugs to receive one kind of oil, and this plastic jug is made from recycled material. They are also fully aware of what categories of plastics are recyclable and reusable in the food storage area. They use reusable crates to keep products fresh and for transport.

3) Relationship with suppliers

In selecting the suppliers for plastic products, Chez Panisse has their own criteria and standards. Currently, Excellent Packaging and Supply⁴ is their supplier, which specializes in sustainable, recyclable, and post-consumer products. Since Chez Panisse involves sustainability concepts into the sourcing of food, they obtain organic and seasonal ingredients from local suppliers. Chez Panisse has established a partnership with local suppliers who share Waters' goals to promote collective sustainability.

4) Sustainability communications

Chez Panisse does not communicate their plastic reduction practices to their consumers or other general public (e.g., through postings on their website or marketing to customers). Nor have they investigated specific environmental impacts caused by plastic wastes. However, the

⁴ Website: <http://www.excellentpackaging.com/>

sustainable food philosophy of Chez Panisse has been communicated and marketed in Alice's multiple books, such as *The Art of Simple Food*, *In the Green Kitchen*, and *40 Years of Chez Panisse: The Power of Gathering* (Chez Panisse, 2015). The value of food sustainability drives the progress of sustainability initiatives on plastic waste management in Chez Panisse.

D. Challenges

Chez Panisse states that one of the main challenges in plastic waste reduction is to find an alternative material for plastic wrap of food storage that is economically feasible for their business, and functions well or better than plastic.

Starbucks

Website: <http://www.starbucks.com>

Starbucks has been a leader in waste reduction and management in the Quick Service Restaurant Sector (Starbucks, 2013), and is the only large fast food brand that consistently provides in-store recycling options to customers (Alexis Petru, 2015). Although facing great challenges, Starbucks established ambitious goals in plastic reuse and consumer education, and has initiated comprehensive recycling programs for plastic waste.

A. Introduction

Starbucks Corporation, generally known as Starbucks Coffee, is a global coffee company and coffeehouse chain that opened in 1971 in Seattle, Washington. As the world's largest chain of coffee shops, Starbucks has 21,160 stores in 63 countries and territories, serves hot and cold beverages, whole-bean and ground coffee, desserts, and sandwiches, and sells items related to coffee such as mugs and coffee presses (Starbucks, 2015).

Starbucks has devoted much effort toward corporate sustainability, such as developing ethical and responsible coffee supply chains, farmer support, and green building initiatives (Starbucks, 2013). With respect to plastics, the primary sources of plastics at Starbucks are cold drink cups, plastic straws, and the packaging of take-away food.

B. Motivation and values

One of the Starbucks' company values is "Being a responsible company" (Starbucks, 2015). Seeing themselves as "innovators, leaders and contributors to an inclusive society and a healthy environment", Starbucks takes a comprehensive approach to their products, partners, stores, neighborhood, shareholders, and the environment (Bo Enquist, 2010). Focusing on the environment, Starbucks' mission includes improving innovative and flexible solutions, and selling and using environmentally sustainable products. Also, they strive to share environmental information with their partners, and integrate environmental responsibility into their corporate values (Bo Enquist, 2010).

C. Plastic reduction initiatives

Starbucks has taken various actions to reduce its plastic footprint, including recycling, reuse, and research:

- Implement Front-of-Store (FOSR) program
- Cooperate with NGOs, government, competitors, and industry regulating organizations to improve recycling performance
- Provide financial incentives for consumers to bring personal tumblers for drinks
- Sell reusable plastic cups
- Research life cycle impacts of three different types of plastic cups to facilitate decision making in selecting cold drink cups
- Disclose initiatives and progress of plastic reduction through their Global Responsibility Report, websites, and other marketing and communication channels

1) Recycling: front-of-store recycling and recycling infrastructure

In 2008, Starbucks set a goal to implement front-of-store recycling (FOSR) for customers in all company-operated locations. In 2012, 24% of the company-operated stores in the U.S. and Canada had the capability of offering FOSR (Starbucks, 2013). This percentage increased to 39% in 2013. For plastic cold cups specifically, 1200 locations were added to the FOSR program, and there was a 90% acceptance rate in recycling markets, meaning that most of the plastic cold cups can be recycled in the local markets. Furthermore, Starbucks cooperates with non-governmental organizations, policy makers, competitors, and industry associations to improve recycling performance. For example, Starbucks works as a member of the Foodservice

Packaging Institute's Plastics Recovery Group to bring solutions to scale and to address common challenges in plastic recycling and reduction (FPI, 2015; Starbucks, 2013).

2) Reuse: the "10 cents discount" and reusable cups

Since 1985, Starbucks rewards customers with a 10 cent discount when the customer brings a personal tumbler or mug for their beverage instead of using store-provided disposable cups (Starbucks, 2013). In 2013, Starbucks launched the waste reduction strategy of selling reusable plastic cups. The reusable plastic cup sells for \$1 in the U.S. and Canada, and for £1 in the UK. As outlined their 2008 plan, Starbucks set the goal of serving 25% of all beverages in reusable cups by 2015 (Starbucks, 2015). Due to these incentives, the percentage of personal tumbler use has increased more than 55% from 2009 to 2011, and customers brought their own tumblers over 34 million times in 2011 (Starbucks, 2015).

3) Research: Comparative Life Cycle Assessment for three different types of plastic cups

Interested in integrating sustainable packaging materials into its cold beverage cup designs, Starbucks is exploring alternative materials for its current polyethylene terephthalate (PET) cold cups and flat lids, seeking better environmental performance characteristics when examined from a life cycle perspective. NatureWorks LLC (NatureWorks), the manufacturer of Ingeo biopolymer (polylactide acid, PLA), could potentially supply this material, an alternative to PET, to Starbucks' drinking cup manufacturers (PE Americans, 2009). To support this effort, Starbucks and NatureWorks have partnered to analyze the environmental performance of Ingeo with respect to the total life cycle of selected bio-based materials and plastics. Polypropylene (PP)

cup as an alternative to the current PET cup was also considered (PE Americans, 2009). This research facilitates Starbucks' material decision making for cold plastic cups, taking into account environmental performance and impacts of different kinds of plastics.

D. Challenges

With approximately 20,000 retail locations globally (Starbucks, 2015), local waste management policies largely determine the process, cost, and effectiveness of plastic recycling programs. As the recycling industry traditionally rejects used cups, the infrastructure for collection, transport, and processing is insufficient. A second difficulty is that some landlords of leasing stores are not willing to provide improved plastic waste collection and recycling infrastructure. There have also been challenges in achieving goal of serving 25% of all beverages in reusable cups by 2015. The other type of challenge is that most of the customers of Starbucks take cold beverages to go, making tracking and enforcement difficult. Consistent execution across thousands of stores and different countries presents additional challenges (Starbucks, 2015). Therefore, the new modified goal is to serve 5% of drinks in stores in personal tumblers by 2015 (Starbucks, 2013).

Hotels

Hotel Andaluz

Website: <http://www.hotelandaluz.com>

Hotel Andaluz in New Mexico was the second hotel in the US to receive the US Green Building Council LEED Gold Certification, and was subsequently honored with the 2011 Earth Minded Award for “advancing sustainable design in the hospitality industry” (Hotel Andaluz, 2015).

A. Introduction

The Hotel Andaluz In New Mexico, listed on the National Registry of Historic Places, opened in 1939 as Hilton’s fourth hotel. It has since changed hands and is no longer a part of the Hilton Hotels and Resorts chain (Hotel Andaluz, 2015). Located in downtown Albuquerque, the hotel was the tallest building in New Mexico when it opened (Hotel Andaluz, 2015). Following renovations in 2008, the hotel became the first historic hotel in the Southwest to receive LEED Gold Certification, while maintaining much of the historic architecture for their 100 rooms.

B. Motivation and values

Focusing on their environmental impact, the Hotel Andaluz maintains that it can provide both high quality and environmentally sustainable service (Hotel Andaluz, 2015). To emphasize their focus on the environment, the opening pages of their guests’ compendium include a section titled “Green By Design: Top Ten Reasons”. Three of these relate to plastic reduction and recycling efforts (personal communication with Angelica Delgado, Sales Coordinator, 2015).

With such a long history in the area, Hotel Andaluz was operating before the rise of single-use plastic items and they continue to find most disposable plastic items unnecessary in the service they provide for visitors (Delgado, 2015).

C. Plastic reduction initiatives

Hotel Andaluz is mainly taking the following efforts to reduce their plastic use.

1) Non-single-use bottled water in their guests' rooms

Providing non-single-use bottled water in their rooms means that the hotel is able to reduce the amount of plastic waste generated. The water, in non-single-use glass bottles, is also locally sourced as a part of the hotel's other sustainability initiatives (Delgado, 2015).

2) Recycling bins

Recycling bins are placed in each room, accompanied by a waste management information card. Thus, guests are encouraged to become knowledgeable about and participate in the hotel's recycling and waste reduction programs (Hotel Andaluz, 2015).

3) Bulk/refillable amenities in the guests' rooms

The highlight of their plastic reduction program is their bulk/refillable amenities in each of the guests' rooms. Fixed to the walls, four bottles in the bathrooms dispense shampoo, conditioner, body wash, and lotion. Guests therefore have plenty of each toiletry without having the unnecessary single use plastic packaging used in most other hotels (Delgado, 2015). Eliminating the need for small plastic bottles can significantly reduce the amount of plastic used in the hospitality industry (Touryalai, 2014).

D. Challenges

To-go coffee cups offered in the lobby of the hotel are their primary source of single-use plastics, although the lids are compostable EcoLids® (Delgado, 2015). While the guests are on the property, proper disposal bins are available to the guests; however, the nature of to-go cups

suggests that the guests are taking the items elsewhere – possibly to places without recycling bins (Delgado, 2015).

Grossman Company Properties: Inn at Laguna Beach

Website: <http://www.innatlagunabeach.com>

The Grossman Company manages six hotel properties, through Classic Hotels and Resorts, with over 1,760 rooms. The Inn at Laguna Beach has 70 rooms and because of its prime oceanfront location in the “Heart of Laguna”, this resort is considered a very desirable travel destination (Trip Advisor, 2015).

A. Introduction

The Inn at Laguna Beach is one of the smallest of the Grossman Company properties with just over 70 rooms, while Arizona Grand Resort and Spa has the most rooms (750). The other properties include Arizona Biltmore Resort and Spa, La Playa Carmel, Laguna Cliffs Inn, and the Hilton Garden Inn (Grossman Company, 2015). Described as a “luxury boutique hotel”, the Inn at Laguna Beach opened in 1990 (Inn at Laguna Beach, 2015). In 2011, the Inn at Laguna Beach made a commitment to improve their plastic reduction, reuse and recycling practices, and have since experienced a significant reduction in their waste management costs.

B. Motivation and values

The Grossman Company aims to provide “economically, environmentally, and socially sustainable built environments,” including their hotels (Grossman Company, 2015).

C. Plastic reduction initiatives

The Inn at Laguna Beach has partnerships with Clean the World and So Clear Beverages to extend the lifetimes of the plastics used in the guests’ rooms, and to significantly reduce the amount of plastic items used by the guests.

1) Clean the World⁵

Through their partnership, the Inn at Laguna Beach sends any of the opened or half-used toiletry bottles to Clean the World - a charity organization whose mission is to send soaps and hygiene kits to third-world countries. The number of toiletries (385 bottles) collected from the Inn at Laguna Beach has resulted in 289 pounds of plastic recycled (Clean the World, 2015). The reuse of the bottles and extra soaps is important because it reduces the need for fabricating additional miniature plastic bottles. The benefits of this partnership are both environmental and social because not only does the reuse/plastic recycling program reduce the amount of plastic sent to landfills, the soaps are beneficial for the hygiene of impoverished communities.

2) So Clear Beverages⁶

So Clear Beverages provides glass water bottles for use in the guests’ rooms; this is a way for the Inn at Laguna Beach to reduce plastic consumption. Furthermore, the partnership with So

⁵ See <https://cleantheworld.org/>

⁶ See <http://soclearbeverages.com/>

Clear Beverages allows for the sanitization, refill, and reuse of the glass bottles from the guests' rooms, leading to significant plastic waste reductions.

D. Challenges

Each of the 70 rooms contains an in-room coffee maker, so the plastic packaging of the single-use coffee supplies is one of the primary sources of plastic consumption by the hotel guests.

Additionally, four 1-ounce plastic toiletry bottles (shampoo, conditioner, body wash, and lotion) are a significant area of the hotel's plastic consumption. These items are common in the hospitality industry, with the intention that the guests will take the toiletries from the rooms, if they like the product (Touryalai, 2014).

Proximity Hotel

Website: <http://www.proximityhotel.com>

Owned and operated in Greensboro, NC, Proximity Hotel is run by Quaintance-Weaver Restaurants and Hotels, whose mission includes an intent "to support our local and global community with a Sustainable Practices Initiative (SPI) that supports our physical world by using less resources" (Proximity, 2015).

A. Introduction

Proximity Hotel is US Green Building Council LEED Platinum Certified, and the owner, Dennis Quaintance says, “We made sure none of our sustainability practices caused one iota of sacrifices in comfort of our guests” (Proximity, 2015). With close to 150 rooms, Proximity Hotel opened in 2007 as an Eco-Friendly hotel in Greensboro, NC (Proximity, 2015).

B. Motivation and values

Dennis Quaintance, the owner of Proximity Hotel envisions a more sustainable hospitality industry, with Proximity leading the way in luxury sustainability (Quaintance, 2008). Their goal is for the guests to not notice a difference in convenience, comfort, or luxury as a result of the hotel’s focus on sustainability (Quaintance, 2008).

C. Plastic reduction initiatives

Proximity Hotel uses a number of approaches to reduce their guests’ plastic consumption, including the following.

1) Glass cups and ceramic mugs to replace single-use plastic cups

Glass cups and ceramic mugs are provided in each of the rooms instead of single-use plastic cups. The drinking water stations in the hallways offer the guests access to clean, locally-sourced water instead of single-use plastic water bottles that “may have unsustainably traveled halfway across the globe” (Proximity, 2015).

2) Partnership with AVEDA

Furthermore, the partnership with beauty product company, AVEDA, means that their toiletry packaging is 100% post consumer recycled PET and guests are encouraged to participate in the

AVEDA Full Circle Recycling Program - any AVEDA location will accept used packaging not accepted in municipal curbside recycling programs (AVEDA, 2015). Through this partnership, Proximity and AVEDA can provide a sustainable service to guests and consumers by reducing their plastic consumption.

3) Electronics recycling

In addition, Proximity runs a drive for electronics recycling in the Greensboro, NC area. While the focus is on recycling the toxic components that pose an environmental health risk, most of the electronics collected have plastic components that are also recycled during the drive. The emphasis on any type of recycling education can lead to increased participation and reduction of consumption (Subramanian, 2000).

D. Challenges

Although the AVEDA packaging is recycled and can be recycled again, the use of single-use toiletries contributes significantly to the plastic waste generated by the hotel. At full capacity, the 147 hotel rooms are furnished with close to 600 bottles each day because each room contains four one-ounce toiletry bottles.

Also, in the main lobby, the guests are given the option of to-go coffee cups with compostable plastic lids. This plastic consumption poses a challenge because the guests take their coffee off the property and may not dispose of the plastic properly.

Rancho La Puerta

Website: <http://www.rancholapuerta.com/>

A hotel that wishes its guests to feel a sense of nature and well-being, the Rancho La Puerta is committed to sustainable practices that minimize the use of plastic at the hotel. It sincerely wants to create a space to breathe freely amidst nature.

A. Introduction

Rancho La Puerta is a family-owned, all-destination resort/spa hotel with 84 rooms located in Tecate, Mexico. It was founded by Edmond and Deborah Szekely in 1940 and has been operated by the Szekely family since. As a family-owned and operated resort hotel, Rancho La Puerta distinguishes itself from chain hotels by providing its customers a strong sense of healthy well-being and the uniqueness of their stay experience.

The “Ranch”, as they call themselves, provides a space “to renew, reflect and redirect one’s longer-living life” (Rancho La Puerta, 2015). A travel editor at the Forbes magazine notes that it is the oldest spa in North America and described the hotel as “one of the most nurturing, soulful spas” he/she had ever visited (Abel, 2012).

B. Motivation and values

The philosophy of Rancho La Puerta hotel is deeply rooted in the founders’ personal believes. The owners hope the hotel provides residents a space for “vacation and perhaps even a new beginning” (Rancho La Puerta, 2015). The founder, Ms. Deborah Szekely, continues to manage

the resort although in her 90s, and embodies a strong advertisement for the healthy and eco-friendly lifestyle that she and her hotel advocate (Abel, 2012).

C. Plastic reduction initiatives

Regarding plastic usage reduction and control, Rancho La Puerta

- Works to emphasize that it is a “green” hotel
- Provides opt-out single-use plastic amenities in the hotel

1) Build the image of a sustainable hotel

Rancho La Puerta tries to emphasize to its guests that it is a green hotel. Many of its guests are attracted by the hotel’s “green” features because they want to get a sustainable and healthy experience. On their website, the Rancho La Puerta advertises that it has a hiking track that passes through oak trees and opens onto a hill nearby, and the track is decorated with cathedral-shaped rocks. It also has a garden that is taken care of by a group of professional botanists and 22 gardeners who provide full-time gardening service (Rancho La Puerta, 2015).

The plants are fertilized using composted organic matter from garden trimming and solid waste from the treatment facility and the composting toilets. Many Rancho La Puerta’s guests are attracted by or at least aware of the hotel’s sustainable practices and green presentation. This makes it easier for the hotel to convince the guests to use less plastic during their stay.

2) Opt out single-use plastic and provide sustainable choices

Rancho La Puerta has made a number of efforts to reduce their use of plastic items. There is a

specific staff member who manages sustainable practice in the hotel. She noted that their biggest achievement was to stop providing single-use plastic cups for water drinking. Instead of using plastic cups for water drinking, the hotel give out good-looking refillable bottles when guests check in and encourage them to use those. In this way, the hotel reduced their use of plastic without sacrificing the convenience. In the Spa area, the locker rooms are prepared with non-plastic robes, slippers, and shampoo bottles. Both shampoo and conditioner are locally sourced and are filled in non-plastic bottles. There are recycling bags prepared in the room and spas. These bags are so-called “bio-bags”, which means that they are totally compostable bags made with cornstarch-derived material. The hotel also buys in bulk whenever possible to minimize the use of cans, bottles, and other containers.

D. Challenges

Cost is a primary concern for Rancho La Puerta. Its sustainable practices have raised and some reviews have complained about its room rates. Moreover, Rancho La Puerta is still looking for additional ways to further reduce its use of single-use plastic. It is looking for sustainable sources for its plastic amenities for its spa that are both in compliant with Mexican laws and international standards.

The King’s Daughters Inn

Website: <http://www.thekingsdaughtersinn.com/>

A historic hotel near Duke University in Durham, NC, the King’s Daughters Inn has preserved its

historic heritage while innovating in environmentally sustainable practices.

A. Introduction

The King's Daughter Inn is located in Durham, North Carolina, near Duke University's East Campus. The hotel has seventeen rooms and is dedicated to provide the intimacy of a Bed and Breakfast while offering guests the amenities of a first-class hotel. The hotel was built in 1925 and was funded by the Duke family. Almost 100 years old, King's Daughters Inn has the philosophy that it should not only preserve the rich history of the hotel but also offer guests the coziness of a classic hotel in an environmentally sustainable way.

B. Motivation and values

Under its new owners, the King's Daughters Inn is committed to "environmentally responsible building and living" as well as the preservation of a historic building (The King's Daughters Inn, n.d.). Soon after completing its renovation, it was honored with several awards, including the 2011 Chamber of Commerce Business Excellence Award for Sustainability, the 2010 North American Green Plus Sustainable Enterprise, and the 2010 Urban Conservationist of the Year (Durham Chamber, 2015).

C. Plastic reduction initiatives

Regarding plastic usage reduction and control, the King's Daughters Inn has

- Preserved historic architecture instead of using plastic materials
- Bought products locally
- Implemented recycling programs to reduce plastic container use and plastic waste

1) Preserve historic architecture

Since the King's Daughters Inn has a nearly 100-years history, the modern owners of the hotel face both the challenge of preservation and sustainable practices. The owners noted that historic preservation and green building practices are compatible. What is more, historic preservation is the ultimate form of recycling. They describe their approach as a "light touch", meaning they use original material and furniture as much as possible (The King's Daughters Inn, 2015). During the modern renovation of the hotel, many parts of the King's Daughters Inn were reused. The historic corridor, dining room, and furniture were preserved and renovated. This approach minimized the use of modern materials that often consist of plastics, and it also restored the original look of the historic architecture for future generations.

2) Buying locally and recycling

For the various amenities used in the hotel, such as food and bath amenities, the King's Daughters Inn buys locally-grown and produced products. They participate in a Farm Share program which means they buy some shares from farm and in return, they can pick up some harvest such as vegetables (Devon Point Farm, 2015). The luxurious bath amenities are all vegetable-based, organic, and manufactured in Raleigh, North Carolina (The Kings Daughters Inn, 2015). The hotel also actively participates in a recycling program in which they recycle plastics.

D. Challenge

One challenge the King's Daughters Inn confronts is how to cut their plastic use while

maintaining the warmth and intimacy of a small local hotel. To address this, they are working to improve their local sourcing network and communicate their effort with guests.

Discussion and Recommendations

The sample restaurants and hotels in our case studies have undertaken diverse approaches to reduce plastic usage and to promote sustainability in waste management based on their individual operating budgets, service styles, and cultures. In general, big chain restaurants/hotels tend to adopt more social responsibility programs aimed at plastic recycling and reuse, and local and small restaurants/hotels tend to reduce their plastic usage primarily by avoiding or limiting their dependence on plastic products. The common characteristic among them all is that they care not only about their financial bottom line but also their environmental footprint and social impact. They are willing to take actions to reduce the negative environmental impacts of their operations and to balance the benefits of these actions with the increased time, effort, and cost it takes to accomplish them. In particular, the following are some general actions taken by both the restaurant and hotel industries.

- Generate sustainability positions to manage their plastic initiatives (for big companies)
- Use sustainability reports and social media to communicate with customers and suppliers (for big companies)
- Replace single-use plastic products with reusable products
- Recycle used plastic products
- Implement staff training regarding plastic reduction
- Educate customers to reduce their plastic use
- Establish selection criteria for suppliers in terms of their plastic packaging

- Build partnership with third party organizations

There are some common challenges as well. For example, the lack of plastic reduction awareness of some consumers inhibit the effectiveness of the initiatives of waste management, and it is hard to find alternative materials to plastic without sacrificing performance in some cases.

In addition, a main challenge for businesses to reduce plastic use is to balance costs and environmental protection. Based upon our case studies, the most commonly identified obstacle for restaurants and hotels is identifying financial incentives for reducing plastic consumption. To address this problem, we suggest that before a benefit-cost analysis is completed for alternatives and reduction initiatives, businesses should know how much plastic waste they are generating, as well as what alternatives are available and at what price. Furthermore, the following two examples might work as reference for businesses when evaluating the trade-off.

Restaurants generally require a large number of straws, which are mostly made from plastic. Replacing plastic straws with paper straws is considered an effective way to reduce plastic waste. However, there is a cost difference between plastic and paper straws. According to online information, a straw from Aardvark, the supplier of paper straws to the Snappy Salads, costs more than ten cents each while a regular plastic straw costs about six cents. In spite of the gap, many restaurants, such as Snappy Salads, are willing to implement the replacement in view of the environmental benefits.

Another interesting example, not one of our cases, is a campaign to reduce the use of plastic

items in Paphos, Cyprus, launched in 2010 by the Cyprus Sustainable Tourism Initiative (Quality Coast, 2013). With three hotels and five additional properties participating, 4500 reusable cloth bags were produced and distributed to customers to reduce the use of plastic bags. In order to incentivize the participants in these and other sustainable practices, the government awarded prizes to participants. The initiative provided reusable water bottles, refillable shampoo bottles, and straws only when requested, and staff training. The result was significant: in 2011 season the hotels reduced plastic use by 19%. The cost saving was approximately 31,000 euro, and 41,000 plastic shopping bags were avoided. What's more, the hotels got positive feedback from both staff and guests (Quality Coast, 2013).

Recommendations for restaurants

Reduce the use of plastic that is passed on to customers

Plastic containers, cutlery and packaging materials for take-away food or beverages are the main plastic products that are passed on to customers by restaurants. Restaurants that have take-away business can implement several approaches to reduce plastic use. For instance, the plastic products could be replaced by alternatives made from biodegradable or recyclable materials. The Snappy Salads is an example that is using corn-made cups for to-go beverage. In addition, plastics that are taken out of stores could be reduced in the following ways, and they should be evaluated and applied according to specific conditions of restaurants:

- Use paper bags instead of plastic bags for take-away food
- Change plastic straws to paper ones for take-out beverage
- Use recyclable and biodegradable materials (such as corn materials) for to-go cups
- Apply compostable options (such as corn and tapioca materials) for take-out utensils
- Replace take-out plastic containers with glass ones and encourage customers to return the containers by offering discounts or through other methods
- Minimize unnecessary packaging (e.g. double wrapping, double bagging) for take-out food

Reduce plastic use by replacing in-house plastic products with alternatives made from other materials

Plastic products in restaurants can be replaced by alternatives, like what Ted's Montana Grill has done with their plastic use in restaurants. Our study suggests the following actions that could be taken to improve restaurants' environmental performance regarding in-store plastic reduction:

- Replace plastic cutlery with metal (e.g. stainless steel) ones
- Replace plastic plates with metal (e.g. stainless steel), ceramic, glass or paper ones
- Replace plastic straws with paper ones
- Replace plastic cups with glass ones
- Replace plastic stir sticks with wooden ones
- Replace plastic table covers with ones made from recycled brown butcher paper

- Replace plastic containers with glass to store food

Recycle plastic products

One of the most common strategies to reduce plastic usage and negative environmental impacts is recycling, for plastics that are used by customers in restaurants and throw them as trash, like in Starbucks. Restaurants can do front-of-store recycling for plastic products by differentiating the recycling receptacle for recyclable plastics with other general garbage, and by actively participating into local recycling markets. In addition, restaurants can encourage customers to bring their used and taken-away plastic containers (e.g. plastic cups, straws, and plates) back to the stores, and include the used items into their recycling program.

Change consumers' behavior

Since the attitude and awareness of consumers greatly affect the performance of plastic reduction initiatives of restaurants, conducting consumer education about the environmental impacts of plastic would highly improve the effectiveness of recycling, reuse, and other measures. Providing financial incentives to consumers is one of the primary ways to educate consumers and affect their behavior. For example, restaurants can provide a discount on bills for the customers who bring their own take-away containers including to-go cups, bottles, and boxes, or who take their food away using their own reusable bags. As mentioned in the case study of The Grey Plume, they are providing a 10% discount to customers who bring their own take-away containers.

Another way of changing consumer behavior is to provide reusable plastic containers that are not as expensive as the common ones that consumers need to buy. For example, restaurants can actively sell reusable plastic cups to customers when they ask for drinks in store or out-to-go. In this way, if consumers don't bring their own cups, they will also remember to reuse this cup bought or bring their own cups next time.

Encourage suppliers to reduce their plastic packaging

Though it is usually not easy to change the performances of suppliers compared with improving the practices that could be totally controlled by restaurants, it is important for businesses to influence their suppliers and there are several means to accomplish this goal.

First, restaurants are capable of choosing products that come with less or even no packaging, as well as products that are packaged in more sustainable ways. For example, beer could come in kegs rather than bottles, and some products could be packaged in cardboard rather than plastic. These actions could automatically encourage suppliers to reduce their use of plastic to package their products. For instance, according to the experience from Ted's Montana Grill, changing plastic straws to paper ones has promoted the development of related manufacturers and industries.

Second, restaurants could encourage their suppliers to reuse or recycle used plastic products. To achieve the goal, businesses could communicate directly with their suppliers the importance they place on reducing plastics. They could also return received plastic products to their suppliers so that the suppliers could reuse the packaging/products.

In addition, restaurants could reuse the plastic products from their suppliers if the products could not be returned to suppliers. For example, Ted's is donating their five-gallon buckets to local communities for other uses.

Establish selection criteria for plastic suppliers

It is required that business owners should be aware of the harm of plastic to both the environment and public health. Additionally, restaurants should be aware of what types of plastics are recyclable. Therefore, the businesses should set up criteria for their plastic suppliers and themselves.

According to successful stories from Ted's Montana Grill, the following criteria might work as reference for decision makers in the service industry. First, avoid bringing in any plastic that is not part of the packaging. Second, the plastic must be recyclable, or reusable in other ways by restaurants themselves or customers. Third, businesses should be responsible for conducting research on their suppliers' sustainability efforts to find out whether their performances are consistent with the businesses' visions.

Educate staff regarding plastic reduction

Staff are an important resource in the service industry to guarantee the performance of plastic reduction initiatives. Improving the waste management awareness of staff is an indispensable step when conducting the initiatives. For example, management can integrate the information of how plastic waste would impact the environment and the necessity of waste reduction into all training programs and materials (e.g. pictorial recycling guides). They can also provide

detailed intuitive materials to all staff in all necessary languages, introducing how to reduce plastics.

Create a sustainability coordinator and produce sustainability reports

As the awareness of environmental protection and sustainable development increases, many companies are creating a designated sustainability coordinator who is in charge of establishing sustainable practices, setting goals, and tracking environmental performance. Service industry businesses should keep pace with this trend to better organize their actions and monitor their progress. Such positions should work together with other departments in the company to achieve their sustainability goals. In addition, the position should take responsibility for generating an annual sustainability report, summarizing the actions taken in the previous year and planning for the future. This is important for disclosure and transparency. As for chain restaurants, Starbucks works as a good example; and local restaurants may refer to the case for Chez Panisse Restaurant and Café.

Implement information disclosure and communication

Trade-offs exist everywhere in sustainability initiatives for businesses. Disclosing the businesses' plastic reduction initiatives, progress, and performance to the public and stakeholders would be an effective way to market their sustainability promotion, improve the company's reputation, and communicate with stakeholders. Disclosure and communication can contribute to the popularity a restaurant. , There are diverse approaches to communicate sustainability by businesses:

- Publishing a Corporate Sustainability Report, or Social Responsibility Report
- Incorporating environmental initiatives in the restaurants' websites
- Advertising in the form of posters, paintings, books, or menus in restaurants
- Marketing to customers through email

Execute social cooperation

With many social, economic, and political factors hindering the plastic reduction initiatives, restaurants can cooperate with non-governmental organizations, government programs, technology companies, competitors, and industry associations to identify more opportunities, earn support, reduce the costs of initiatives, and mitigate risks. An effective and economically efficient way for these service industry businesses to reduce plastic usage would be to organize campaigns to drive progress. For example, they can push for government seed grants to support the development of plastic recycling and disposal technologies, which could be used by companies to develop more environment-friendly products and to market themselves as eco-friendly cooperation.

Research

In order to have a better understanding of how plastic usage increases businesses' operating costs, and how plastic products impact the environment and human health, restaurants can conduct research on this topic either independently or by cooperating with research institutions. For example, businesses can do Life Cycle Assessments (LCA) for the primary plastic products used in operations to identify hotspot environmental impacts of the products, and to

compare the benefits and costs with other materials. This strategy will facilitate the decision making process in plastic products selection and replacement, and also improve the performance of other initiatives in their sustainability systems.

Additional suggestions for chain restaurants

As for restaurants that own many franchise stores, such as Ted's Montana Grill and Starbucks, additional actions can be taken. Chain restaurants may have stronger selection and control over their suppliers compared to individual restaurants. Therefore, it is their responsibility to set more strict criteria for their suppliers regarding plastic reduction, and suppliers might be more willing to implement such requirements based on the larger orders and longer demand period. Within such restaurants, such companies could conduct programs to reduce the plastic use on a relatively larger scale.

In accord with plastic-reduction actions, these companies should also keep track of their plastic use and record relevant data as the amount would be large and worth tracking all over the stores. In other words, these restaurants should establish an inventory tracking system to record their use of plastic. Examples of recorded data include the amount of plastic containers/straws/bags and costs for plastic products per week/month/season.

In addition, chain restaurants should apply uniform standards for all of their stores in terms of plastic reduction, not only for their in-store or take-out applications, but also for their supplier selection. As for the latter problem, there are generally two ways to fulfill the goal. First, restaurants could use the same producers and manufacturers for the products provided by their

suppliers. Second, as stores in different states must meet local requirements, the management is responsible for understanding the restrictions, such as what kinds of plastic are recyclable in specific areas, and should work with local suppliers or organizations to meet such requirements.

Recommendations for hotels

Establish a plastic waste management system (including a sustainability manager)

An integral part of a hotel's sustainability initiatives should be a detailed waste management plan. Hotel managers should first make a list of resources that could be used for the hotel manager to identify the current usage of plastic items in the hotel. Initial baseline plastic waste inventories can be performed with a financial audit. Data and current plastic usage will help inform the hotel manager where the hotel is using the most plastic. A sustainability manager or team can be established, if the hotel has sizable staff. This role could take the lead to investigate the current use of plastics. If sustainable alternatives are available, the sustainability manager can gauge interest and plan for possible implementation.

The sustainability specialist can also examine the details of plastic use in the hotel and produce a sustainability report that will help inform the amount and hotspots of plastic usage in the hotel. Using some of our questions from the online survey as well as conducting on-site investigations, hotels can produce a template for annual analysis. This will make return on investments in non-plastic products easier to be monitor through time, and progress of plastic reduction could be presented clearly.

Replace single-use plastics

Hotels can provide guests reusable and refillable amenities instead of supplying single-use plastic products, such as bottles of shampoo, conditioner and water. Considering that it may be difficult for guests to choose between the convenience and comfort of a hotel and the sustainability of a hotel, the onus is on hotel managers to provide sustainable convenience. For example, Rancho La Puerta provides opportunities for guests to use less plastic by giving them refillable bottles when they check-in. This reduces the need for single-use bottled water in the hotel without sacrificing convenience. Additionally, the bottles should be well designed, making it even interesting to have and use. Another approach is to provide water packaged in glass bottles in rooms.

Educate and encourage customers to reduce plastic use

Many actions can be taken by hotels to encourage their guests to reduce plastic waste. Hotels could provide guests everything they need to opt out of unsustainable options. Reduction of single-use plastics includes using pencils instead of pens, ceramic mugs and glass cups instead of plastic and styrofoam cups, and bulk bathroom amenities instead of individual use plastic bottles.

In the case that single-use amenities are used by hotels, a new system for distribution can be implemented; for example, having guests receive the items at the desk when they check-in, free of charge or for a small price - like a mini bar. This system is likely to cut down plastic waste

because the guests are provided with the items they need while extra items remain undistributed.

Recycle used plastic products

Recycling bins and information about local recycling practices should be provided in hotel rooms. Moreover, many hotels serve as meeting venues, thus, providing easy access to proper information and disposal bins in the public spaces will spread awareness throughout larger community.

Education and innovation initiatives

Staff training is also an effective way to make progress in plastic reduction. This includes providing training materials with data on plastic consumption and waste generation, so that employees are informed and encouraged to make a difference for the hotel and the community. One of the best ways to change behavior is by making the education “hit home” - staff training can do this by suggesting participation in litter cleanup events, by having employees complete a plastic audit, or by offering rewards to innovative ideas that will help the hotel reduce its plastic consumption.

Use old materials in renovation

Another strategy concerns renovation and reuse of materials. Both King’s Daughters Inn and Hotel Andaluz used antique furniture and even recycled architectural materials to minimize the use of plastics and other newly fabricated items. Dining rooms and meeting rooms in hotels that

are decorated with these historic elements are often more attractive and appeal to patrons looking for a more intimate and unique hotel. This adds aesthetic value to the hotel and also reduces the amount of plastic and other waste generated.

Responsible sourcing

Nowadays hotels purchase a wide range of plastic products, from single-use caps to plastic pillow and mattress fillings. The purchasing power of hotels could deeply affect the sustainability in many communities. Creating a comprehensive profile that describes the sourcing of products used could help the hotel manager better manage the sustainability of the hotel. A crucial aspect of responsible sourcing is to establish consistent sourcing criteria for hotels. Whether at large global hotel chains or small B&Bs like the King's Daughters Inn, hotel managers should ensure the sourcing standards are in line with sustainability standards and local regulations. From the results of our survey, some hotel managers do not fully understand their local plastic regulations and options.

Information sharing

Sharing information and communicating plastic reduction effort to guests and investors are important. Visualizing the plastic waste data is one way to better communicate plastic reduction progress. Sustainability managers should make plastic-use data more accessible by producing graphs and tables. Such graphs could both educate the hotel guests and hotel staff. The goal is to identify areas of operation where plastic waste can be reduced.

Partnership building to close the loop

In addition to sharing information internally, sharing information across the industry or even across multiple industries could have a great impact upon the reduction of plastic. Amenity suppliers can work with hotels to switch to bulk, refillable, or recyclable options, so that vast quantities of half-used single-use shampoo bottles are not sent to landfills. AVEDA has a Full Circle Recycling program for all of its packaging, and their packaging comes from post-consumer recycled materials. Another organization working with the hotel industry is Clean the World, a non-for-profit aimed at distributing soap and hygiene amenities to third world countries.

The power of partnerships is in mutual benefits; figuring out what organizations to work with may be difficult, but employing a sustainability manager to coordinate information sharing can promote the likelihood of building partnerships with organizations who have similar motivations.

Green marketing

Green marketing is also a good strategy for hotels. For example, hotels can advertise themselves to be “sustainable hotel”. Besides factors such as prices, convenient experience, beautiful natural view, delicious and local food, hotel’s green initiatives such as plastic reduction, waste management, and other sustainability practices will also attract customers.

Rancho La Puerta serves as a good example of green marketing. Usually customers choose a hotel primarily based on the price and the services that the hotel provides. Rancho La Puerta offers its guests an expensive but unique experience. The guests might choose Rancho La Puerta because they know about the beautiful natural view, the local food, and everything about well-

being that this hotel offers. Therefore, providing customers with more choices, especially sustainable experience, is in harmony with hotels' values and the commitment to provide great services.

Conclusions

To understand environmental practices regarding plastic reduction in selected industry sectors and to provide advice to companies in related fields, we conducted online surveys and phone interviews to collect information on successful examples. Our study focused on the restaurant and hotel industries and selected both large and small players to learn about their experiences. Based on their achievements, as well as the lessons they have learned through the progress, we generated case studies to describe the companies' efforts, analyzed their actions, and developed recommendations and suggestions.

Plastic is a daily-used product that is convenient. However, plastic poses a risk to public health, poisons wild and marine life, and contributes to environmental pollution when it is discharged into surroundings. Motivated by social responsibility and branding, restaurants and hotels are taking steps to put in place environmentally friendly programs, especially in the fields of energy efficiency, food security, and water reduction. Nevertheless, the reduction of plastic use has not received enough attention to. Based on the success stories of pioneers in selected sectors, many practices could be implemented to accomplish significant plastic reductions, both through the companies' internal actions and by establishing eco-friendly relationships with their suppliers and customers.

To more fully understand the the benefits and trade-offs in plastic reduction efforts, further work should include an in-depth financial analysis, to help companies make both practical and

affordable decisions. Furthermore, more case studies in other industries could be developed to provide a wider range of innovative approaches, especially in plastic-intensive, such as in concert/festival promotion and in the airline industry.

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Appendix

Online Survey

Company/Organization Name

1. Could we have the name of your company/organization?

General Information

2. What is the ranking order of the following motivations for your company/organization to improve your sustainability practices? (Please drag the answer to put them in your order: Stakeholders, Social responsibility, Economic profit, Mandatory requirement from government)
3. Is someone in your company/organization responsible specifically for sustainability practices?
4. Do you produce an annual sustainability report or similar self-evaluation? If so, may we see the report?

Plastic Used

5. What types of plastic products are used in your business operations, and in which specific parts of operation, e.g. on-site use and packaging?

6. How much plastic does your business consume per week or per month (kg) according to records or your estimation? Do you have any tracking systems ? If so, how does your tracking system operate?
7. What is the cost (estimated or actual) of all plastic products used (per day or per week)? What percentage of your total non-salary costs (weekly or annual) does the cost of plastic products represent in your operation?
8. Do you have selection criteria in selecting the types of plastics used? If yes, please describe.
9. Have you considered the recyclability of your plastic products used?
10. Do you know what types of plastic are recyclable in your area? (I have no idea; I am sort of aware; I am fully aware).
11. Who are your plastic products suppliers? What selection criteria do you use when selecting your suppliers?
12. Could you briefly describe to us your thinking on balancing financial costs vs social responsibility?

Plastic Waste

13. Within your company/organization, there may be plastic waste that your company/organization must discard; in addition, there may be plastic that you pass

along to your customer that they must ultimately discard. What proportion is your plastic waste produced within the company/organization? What proportion of plastic waste is passed on to your customers/consumers?

14. If you have plastic waste produced within the company/organization, how do you deal with plastic waste? Do you have any specific recycling contractors or recycling, reusing, or disposing the plastic waste generated by you? What is the actual or estimated cost (per week or per month) of recycling, reusing or disposing of plastic waste?
15. How do you communicate your sustainability promotion initiatives in the perspective of plastic reduction to your clients or customers? (Including plastic reduction in company's value; Posting on the website; Marketing to customers through emails; Sustainability report; None of above)
16. Since plastic waste might cause serious environmental impacts, such as soil erosion, air pollution, and greenhouse gas (GHG) emission during the life cycle, is your company/organization considering or monitoring the above environmental impacts? If so, do you have any relevant data and can you share them with us?

Plastic Alternatives

17. Have you investigated any alternatives to the plastic products used in your business? If so, what are the potential alternatives?

18. Have you considered a more sustainable business model related to plastic wastes? If so, what is your process and current progress?

Follow-up Interview

19. If we are unclear about some of the answers, would you be willing to have a short follow-up phone interview with us? Thank you!

Table A. Table of Responses

No.	Questions	Chez Panisse Restaurant and Café	Ted's Montana Grill	Grossman Company	Sani Resort
1	Ranking of motivations to improve your sustainability practices	<ol style="list-style-type: none"> 1. Social responsibility 2. Stakeholders 3. Mandatory requirement from government 4. Economic profit 	<ol style="list-style-type: none"> 1. Economic profit 2. Social responsibility 3. Stakeholders 4. Mandatory requirement from government 	<ol style="list-style-type: none"> 1. Social responsibility 2. Stakeholders 3. Economic profit 4. Mandatory requirement from government 	<ol style="list-style-type: none"> 1. Social Responsibility 2. Stakeholders 3. Economic profit 4. Mandatory requirement from government
2	Is someone specifically responsible for sustainability practices?	Yes	Yes, our Purchasing and Sustainability Manager, along with our Green Team and Executive Team	Yes	Yes
3	Do you produce an annual sustainability report or self-evaluation?	No	We debuted a Sustainability Story (more of a history) in 2013 and will update that this year. Will probably update that every 2 – 5 years. You can find a link to the Sustainability Story on our website (www.tedsmontanagrill.com)	No.	Yes
4	What type of plastic products are used in your business operations?	No take away so plastic use is limited to plastic wrap for food storage	Plastic wrap, high density 5 gallon buckets, and other #1/#2 plastics. Other than plastic wrap, all plastic is from supplier packaging (mayonnaise, sour cream, spices, etc.).	Plastic bags, water bottles, cps, etc.	Main sources of plastic; a) Fresh products are sometimes delivered wrapped in plastic, we are working with suppliers to reduce this b) Amenities in rooms c) plastic bottles for beaches, which are required by law in Greece d) we have plastic straws at bars upon request, though we have replaced some of these with paper straws (they are very expensive)

5	How much plastic does your business consume per week or per month?	No specific tracking system but almost all products are fresh and are transported in re-usable crates	Plastic consumption is not a specific metric for us as most of our recycling is single stream and we do not have visibility to the amounts for each stream	I don't have any tracking info available	In the season - 7 months - we consume 0.016 kg/guest night (about 60000 room nights). We track the amount of plastic based on what we purchase, as we need this in order to estimate percentage of recycling
6	What is the cost of all plastic products used (per day/per week)?	\$40/week	Working with our 3rd party provider to get this figure. Not yet available	I'm not sure	I am afraid I don't have this data at the moment as our offices are closed
7	Do you have selection criteria in selecting the type of plastic used?	Tried many different sustainable plastic wrap substitutes but nothing really works very well. Currently we use plastic food film. Since we use so little, we don't worry about it too much	1. Avoid bringing in any plastic that is not part of supplier packaging. 2. If do bring in plastic, must be recycled source material. 3. Must also be reusable by guests, or recyclable in most municipalities	No	PET which can be recycled is preferable. Recycled plastic is also preferable
8	Have you considered the recyclability of your plastic products?	Yes	Yes	Yes	Yes
9	Do you know what types of plastic are recyclable in your area?	I am fully aware	Mostly, although we operate in 16 states and are subject to many different landlord and municipality restrictions	I am sort of aware	I am fully aware
10	Who are your plastic products suppliers?	Excellent Packing is our paper goods supplier. They specialize in sustainable/recyclable/recycled/post consumer products	All other plastic is supplier packaging	Don't know	We have sustainability criteria for all suppliers

11	How to balance financial costs and social responsibility?	Social responsibility trumps financials costs		We do our best to make thoughtful decisions, and area also keenly aware of costs. We can only do so much before the costs equation no long works. We think institutional change is the best means at achieving quick action in a level playing field, so that all our competitors must do the same	
12	What proportion of plastic waste is passed on to customers?	We pass none on the consumer. We receive one kind of oil in large plastic jugs. The plastic is made from recycled product	What selection criteria do you use when selecting your suppliers? Research their sustainability efforts and practices to make sure their philosophy is closing aligned with ours. Must see measurable results in water and energy conservation, and must see recycling efforts within the plants	We are consumers only	It's about 50-50

13	How to deal with plastic waste internally?	Our plastic jugs are already and not coded for city recycling so they go in the landfill trash can	Ultimately a company is in business to make a profit, but we believe strongly you can build a successful business while still preserving the natural world around us. We take environmental considerations into every decision we make. We are committed to acting responsibly, preserving what we can, and helping to raise consciousness concerning the health of our planet	N/A	We recycle internally
14	How do you communicate sustainability promotion initiatives to customers?	None	Sustainability Story, website, social media, email newsletters, employee conversation with guests	None	Including plastic reduction in company's value
15	Do you keep data on environmental impact?	None	No	None	We only measure it in quantity and our reduction
16	Have you investigated alternative plastic?	Yes	Yes, working with Vendor partners on new, more sustainable packaging materials	Yes, we have introduced glass water bottles	Yes
17	Have you considered a more sustainable business model related to plastic wastes?		Have eliminated 97% plastics that are not related to supplier packaging	Yes	Yes

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