

A Case Study: How an urban produce company reduced waste to zero while providing environmental and social benefits to the community.

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Abstract

This paper aims to detail best practices and lessons learnt on how a midsized business in an urban area not only reduced waste, but also incorporated social benefits to the community at large. The distribution of food products from wholesale to retail entails a potential waste stream. Pallets, corrugated boxes and plastic wrapping are items that can end up in a land fill. It is critical for urban areas to reduce waste to minimal levels. Over the course of eight years beginning in 2005 and under the direction of Facility Manager Scott Lutocka, Piazza Produce Incorporated [PPI], located in Indianapolis, Indiana, began a journey that has resulted in zero waste.

In PPI's baseline year of 2005, the company generated 2,175 tons of waste which was transported to local landfills. This waste contained about 50% Old Corrugated Cardboard (OCC). By 2010, PPI recycled OCC, plastic stretch wrap, colored plastic pallet straps, colored plastic wraps, plastic pallet slip sheets, Ag-Poly corner boards, wooden pallets, and other materials. In 2011, a new program and collaboration with Crossroads Industrial Services in Indianapolis began. Workers with disabilities turn the recycled Styrofoam waste into picture frames and Walmart buys the new frames back (which consist of 80% post-consumer recycled content) and sells them in their retail stores. This is example of a closed-loop recycling process. This, too, supports the local Green Economy recycling jobs as well as to prevent such materials from entering a local landfill.

The last part of the waste stream (15%) to be addressed was compostable food products. By 2011, a compost diversion program was developed and implemented. All along the way barriers both internal and external had to be addressed and removed. This paper delineates the steps taken so that others may replicate Piazza Produce's zero waste success stories.

Keywords: community-industry collaboration, green economy, sustainability, recycling, zero waste

1.0 Background

The question of whether ecologically sustainable business practices can enhance financial solvency of companies can significantly influence managerial decisions of adoption of said practices (Clelland, Dean, & Douglas, 2000; Korhonen, 2003). Ambec and Lanoie argued that “[m]anagers have long associated environmental protection with additional costs imposed by government, which in turn erode a firm's global competitiveness” (Ambec & Lanoie, 2008). Instead of government policies which can be seen as negative by managers, the goal of market-based approaches is to design and put in place incentive systems that will positively influence businesses to adopt practices that benefit the company's financial stature while also engaging in sustainable practices (Argandoña, 2004; Beheiry, Wai Kiong, & Haas, 2006; Larson, Teisberg, & Johnson, 2000). Medium-sized companies often lack the resources to implement system-wide sustainable practices often citing lack of manpower to oversee implementation and oversight. However, case studies indicate that even smaller companies who do not typically have on site ‘sustainability managers’ can set up a comprehensive system if the program ends up saving the company resources (Farrow, Johnson, & Larson, 2000; Gutberlet, 2009).

There is growing empirical and theoretical interest in post-consumption activity that results in the capture and creation of value from waste in the global economy. Sustainable practices have moved in this direction, over the past decade, adding value to recycling programs. Rather than just disposing of refuse, companies are repurposing recyclables into desirable end products (Lepawsky & Billah, 2011). There is a trend, too, to build social capital into corporate sustainable practices (Coe, 2010). In engaging people with disabilities to manufacture goods from recycled materials, economists must factor into the equation not only the energy saved from the repurposed materials and the jobs created, but also the intangibles of creating community where none existed (Roland, Wassenhove, & Atasu, 2007; Schur, 2002).

2.0 Case Study Introduction

Piazza Produce, Inc. piazzaproduce.com is a family-owned wholesale food service produce distributor that supplies restaurants, country clubs, caterers, in-plant food cafeteria service operations, commercial airlines, as well as colleges, universities and schools with fresh fruits and vegetables, dairy products, frozen foods and specialty foods. Products are sourced locally, regionally, nationally as well as internationally. The company operates a modern distribution center with a fleet of 145 refrigerated trucks, and services customers within a 250-mile radius of Indianapolis, Indiana, USA. The company is categorized as midsized, and like establishments globally can emulate the sustainability program perfected within the past five years. The case study presented here delineates the steps taken and barriers overcome so that other urban, midsized produce providers may consider this model within their respected businesses.

In 2005, the company's waste invoices continued to increase nearly monthly unabated with no end in sight. This observation prompted the Facility Manager (FM) to investigate whether or not this escalation in waste removal expenditures were merely the ‘cost of doing business,’ or whether there was an opportunity to try and mitigate the expense and corresponding increased waste. In the baseline year of 2005, an audit determined the

company generated 2,175 tons of waste which was transported to local landfills at an approximate cost of \$100,000.00¹.

A second audit was arranged to confirm initial findings. The trash compactor was hauled to the landfill where the contents were emptied out upon the ground wherein the FM used his digital camera to document the contents of the trash compactor. This process confirmed the initial findings by the waste consultant that approximately 50% of the waste stream contained Old Corrugated Cardboard [OCC], which had value in both reducing waste costs if diverted, and as a potential revenue producing recycling commodity in the form of baled OCC.

The initial goal was to reduce financial costs; later environmental and social benefits were sought. If the company could divert the OCC from the waste stream, it could save about 50% on costs. The company also followed the consultant's recommendation and installed an OCC baler machine. In addition to removing the OCC from the waste stream, the OCC, now baled, was recycled. When minimums were reached to fill a trailer truck the bales would then be taken to a local paper mill in Indiana where the OCC was recycled into new paper fiber. As a result, the PPI received rebate checks from the recycling company for this valuable recyclable material, which incentivized further exploration for waste reductions.

The city of Indianapolis with a need to reduce landfill inputs provided incentives to encourage businesses to recycle. This generated new business opportunities to mitigate waste end products of one company while creating input materials for another; all businesses received financial advantages after participating in this closed-looped system.

3.0 Methods Phase I

Initial barriers that PPI faced were the lack of needed containers to collect the OCC during the normal course of business in the distribution center. Startup costs for this type of program can be expensive, and PPI management did not see the benefit at the start. The FM procured four, 1-yard tip carts at a cost of nearly \$800 USD each. This expense came into question by ownership when the invoice was submitted for approval for payment. The results of the waste audit were then discussed and an explanation offered as to why these were necessary tools in order to help control waste costs. Throughout the development of this new program continual education on the cost/benefit ratio to senior administrators proved to be a positive return on investment. It can't be understated that the initiative of a single individual, the FM, and communication between said and senior staff required attention and tenacity. A set of principals were set in place. Set SMART Goals: Specific, Measurable/Metrics, Achievable, Realistic/Relevant, and Time-bound. Goals must be reviewed and adjusted as conditions change.

The next steps were to train the Day Operations shift workers how to divert and recycle OCC. It was assumed that the company's employees would begin changing their work habits and follow the instructions to dispose of OCC into the trash compactor. After a failed first training meeting yielded zero results, a second training meeting was held, and the

¹ Not adjusted for inflation

employees were once again asked to follow instructions and cooperate. A subsequent review of that following month's waste invoice saw no improvement. It became apparent that incentives for behavior change were required.

Determining incentives at low cost, but meaningful to employees took some thought. The FM purchased nine utility knives for \$60.00 USD. He purchased enough of the utility knives for each of the Day Operations Maintenance staff. The FM met with his team and distributed the utility knives with the understanding that they were to be used to break down the cardboard boxes and to bale the OCC. The employees were very appreciative of this 'gift' (tool). The next day while the FM was making his daily inspection of the facility, the Receiving Department's employees approached the FM and inquired about the utility knives. Realizing how quickly that the word had spread, the FM realized that this incentive was required in order to change behavior. As a result, the FM distributed utility knives to the Receiving Team as well, and also asked for their help with recycling cardboard.

A few days later, the FM stayed late to work on a project and was approached by members of the Night Shift Operations Department. They, too, had heard about the utility knives and wanted to know how they might receive one. Knowing that it was not going to be possible to distribute an additional 145 utility knives, the FM created a plan to include others in the program. The FM met with the Night Operations managers and asked them to identify two evening shift employees who would be tasked with overseeing the recycling of OCC as well as to serve as a barrier to the trash compactor thereby limiting its access to the general non-trained Night Operations employee group. These two employees were given the utility knives and were trained on how to sort and recycle OCC during their shift.

The next month, the invoice amount for waste removal began to fall. A few months later, as improvements continued in recycling volumes and invoice cost reductions, the Night Operations recyclers were presented with custom embroidered company logo jackets with their names on them. The employees were extremely appreciative and continued to be diligent in their ongoing efforts while working the night shift.

It is important to note that changes slowly began to occur in 2006. By 2007, even more OCC was being diverted. The FM kept records of all OCC trailer loads that were submitted for recycling. The FM also continued to inquire about the cost and various fee structures that were inherent with the then-current waste contract. Some fees were easily discernable while others proved more difficult to expose and to clarify. On many occasions, it seemed that the waste hauler was not willing to divulge such information to their customer. Thus began a tumultuous relationship when it was also discovered that the waste hauler who was managing the OCC recycling program failed to pay rebates for three trailer loads of OCC that year. Initially, when it was brought to the waste hauler's account representative's attention in 2008, he dismissed the matter. When he realized that it was not going to be ignored by the FM, a full audit was conducted and it was discovered that three truckloads of OCC had not been accounted for and paid to PPI. This reduction in payment amounted to approximately \$7,000.00 USD. This point stresses the fact that oversight is critical to every step in the program.

Through the end of 2009, improvements continued in the company’s waste reduction efforts as well as improvements in recycling rates. By 2010, PPI was now recycling OCC, plastic stretch wrap, colored plastic pallet straps, colored plastic wraps, plastic pallet slip sheets, Ag-Poly corner boards, fiber corner boards, blended material corner boards, industrial batteries, scrap metals, office paper, Aluminum cans, plastic beverage containers, wooden pallets, and other materials [Figure 1]. Now, five years into the program and as a result of gradual yet continual improvement, the company broke even for the first time in its history on waste removal costs. The comprehensive recycling program reduced a need to haul refuse and at the same time the recycling program also provided rebate checks (a new found revenue source).

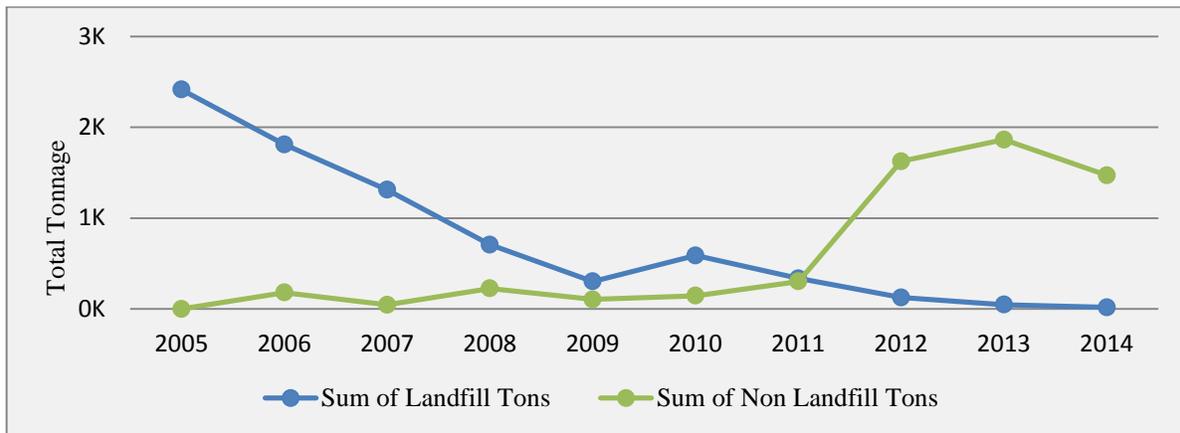


Figure 1 Landfill and non-landfill tonnage by year

3.1 Methods Phase II

In the first quarter of 2011, the FM attended the ProMat Material Handling Show promatshow.com in Chicago, Illinois, USA. While there, he visited with representatives of IFCO Pallet Systems palletsbyifco.com/recycling. IFCO Pallet Systems provides pallets for purchase in addition to a buy-back program for used pallets. PPI had broken pallet boards that required removal. The IFCO representative shared that their company collects broken pallets at no cost to the supplier and grinds the wood into mulch. Through a series of conversations and goal setting, a new procedure began that captured PPI’s wood waste and diverted it from the trash compactor while supplying the urban area with mulch [Figure 1]. The company realized an additional five days of use between pulls on the trash compactor. This one small change had a significant impact, and added additional benefits in the closed-looped system (mulch for city gardens).



Figure 2 Recycled pallet boards to city mulch

3.2 Green Economy and Social Benefits

Unforeseen indirect social benefits materialized in 2011, and PPI seized the opportunity. Crossroads Industrial Services crossroadsindustrialservices.com located in Indianapolis, Indiana, USA, obtains waste products and recycles the material thus creating product inputs. The income of Crossroads Industrial Services solely supports programs and services for persons with disabilities and their families as offered by Easter Seals Crossroads.

This facility features one of their production lines that employ local workers who have disabilities. The production line processes Styrofoam where it is cleaned of tape and debris, fed into a chopper, and then introduced into a gravity-fed hopper which then processes the Styrofoam pieces into an impeller-driven densifier machine. For every 40 semi-loads of loose Styrofoam that the facility receives, it condenses the Styrofoam into a single semi-load of densified plastic. This line employs six or seven workers full-time. The plastic is then shipped to a manufacturing plant in Wisconsin which uses the condensed Styrofoam in the production of Uniek branded uniekinc.com picture frames [Figure 3]. PPI supplies some Styrofoam to Crossroads, but not at the scale that Wal-Mart can, who supplies the majority of Styrofoam packaging to Crossroads Industrial Services. Wal-Mart then purchases the new picture frames (which consist of 80% post-consumer recycled content) and sells them in their retail discount stores. This is an example of a closed-loop recycling process. At each step of the commodity processing chain, what was once considered waste is now an input for another product. All along the recycling supply chain jobs are created, which builds the local Green Economy.



Figure 3 Picture frames from recycled materials

RecycleForce recycleforce.org recycles discarded electronics. What is so unique about RecycleForce is that they hire, train and then pay their workers, who are recently released ex-convicts, a living wage of \$15.00 USD/hour. PPI utilizes graduates of this training program to sort, disassemble, and recycle items in its E-Recycler Program. One of their responsibilities was to ensure that PPI's downstream components do not end up overseas, or American landfills. Although PPI is one of many Indianapolis companies who use RecycleForce's services, it deliberately incorporated holistic and socially responsible *human* recycling into its Green business objectives.

3.3 Zero Waste and Composting

The product packaging and shipping materials were now directed into each of their respective recycling programs, but that still left 15% of PPI's remaining waste to be considered. Organic materials such as spoiled or otherwise damaged produce had not been addressed. Three key urban players united to find a solution. One member of the collaboration was a non-profit, Indiana Recycling Coalition (IRC) indianarecycling.org ; in addition, a local city composter GreenCycle greencycleindy.com and PPI completed the team. During this start-up period, the IRC was hosting their annual meeting and recycling conference. The FM attended a seminar on the topic of Zero Waste. The instructor, Gary Liss (internationally recognized for his work in the Zero Waste arena as well as participating in the creation of an internationally-accepted definition of Zero Waste) and the

FM realized that PPI was already at an 85% waste-to-landfill diversion rate having accomplished this by comprehensive recycling programs.

Since organic waste falls under the category of ‘industrial waste’, a commercial compost permit would be required in order to process this biodegradable waste. An application was filed with the Indiana Department of Environmental Management, and was eventually approved six months later after much internal changes to the statutes and language that governed the definition of ‘industrial waste’. The permit was received in September of 2011. A commercial compost diversion program was developed, introduced and implemented that October. With two months of metrics data, the company had finally reached the 90% waste-to-landfill diversion metric for the first time in the company’s history. As defined by Gary Liss and Zero Waste International Alliance “Zero Waste means designing and managing products and processes to systematically avoid and eliminate the volume and toxicity of waste and materials, conserve and recover all resources, and not burn or bury them”(zwia.org). PPI had reached its goal.

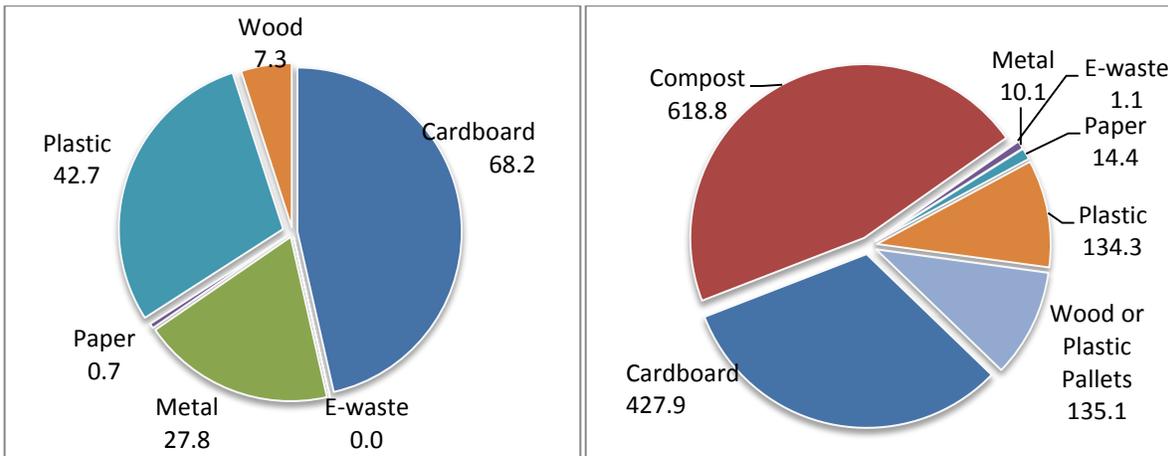


Figure 4 Recycling breakdown 2010 (tons) Figure 5 Recycling breakdown 2014 (tons)

4.0 Awards, Lessons Learned and Dissemination of Findings

In November 2011, PPI and its sister companies applied for a United States Federal energy grant. This grant was to be used for replacing high-bay metal halide 400w lamp fixtures with energy efficient lighting. PPI’s zero waste program and sustainability initiatives weighted the application in its favor. The federal grant award, \$191,000.00 USD, covered 85% of the costs to re-lamp four PPI facilities in Indianapolis, Indiana. Combined, with Indianapolis Power & Light Company rebates and Environmental Protection Agency tax credits, the project for all buildings resulted in zero infrastructure costs to PPI. In addition, monthly energy utility savings decreased by approximately 15%. The lighting project was completed by the end of January, 2012.

With the success of having reached the Zero Waste milestone, the IRC was very impressed with our achievement. They shared PPI’s success stories with Indianapolis Mayor Greg Ballard and applied to the city’s 2012 Sustainability Award Program. Piazza Produce was

awarded the Mayor's 2012 Reduce, Reuse, and Recycle Award that year insideindianabusiness.com/newsitem.asp?ID=52898.

Heritage Environmental Services (heritiage-interactive.com/data-management.html) also awarded PPI with their coveted "A World of Difference" Award in May of 2013 for its work in being 100% waste-to-landfill free. (Note: the remaining 5% of the company's non-recyclable and non-compostable wastes were being transported to Covanta Energy where it is burned to create steam energy versus being hauled to a local landfill and buried.) In June of 2014, Piazza Produce received the Food Logistics "Top Green Providers" Award for the company's Zero Waste and Sustainability efforts. And RecycleForce recently awarded PPI with their RecycleForce 3rd Annual Corporate Challenge Award' in December of 2014.

5.0 Costs and Savings

The breakeven point came approximately five years from baseline. Startup costs cannot be underestimated and should be factored in when making a strategic plan to reach zero waste.

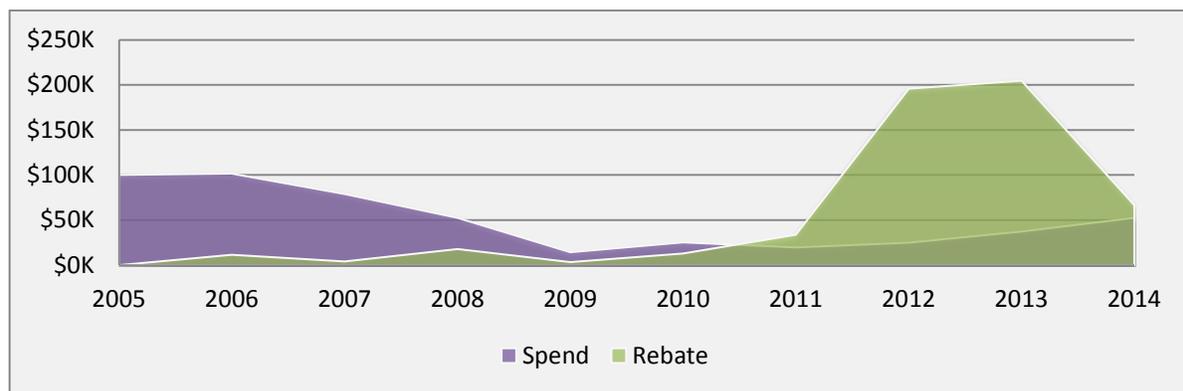


Figure 4 Breakeven point in savings

A budget for contingencies in order to ensure that the long term goal is reached provides insurance that the program will not dissolve.

6.0 Conclusion and Recommendations

Throughout PPI's Zero Waste journey, it became apparent that we could not embark on this project or journey without the help and assistance from a number of like-minded consultants, service providers, recyclers, non-profit support groups, State Regulators, employees and critically PPI's proprietors who created a culture where success could ultimately be achieved. Without such partners and support, we do not believe that Zero Waste is achievable (Wright, 2012).

Although it would have been nice to have had a Zero Waste road map or plan in place from the beginning, we would not have traded the small victories, some defeats and failures, education, support and mentoring for a pre-structured plan. What we learned is that you must be able to adapt to the barriers, the nay-sayers and other challenges along the way. Changing culture, employee habits, procedures, is never an easy task.

We believe that one of our keys to success has been in our simplicity of our program. There were times when we expected too much of our employees and realized that while it made sense initially, for example, to sort all recyclable materials on the loading docks that it proved too burdensome for tired employees at the end of their respective shifts. We adapted a co-mingled container collection system and transported the waste to another area for proper sorting by a trained group of employees. That small change kept everyone participating in the program. It is crucial to involve all employees, no matter how little it appears, as it is the aggregate totals that ultimately matter and made the difference. By the end of 2014, PPI is 97.5% waste-to-landfill free, with the remaining 2.5% diverted to waste-to-energy in the form of steam.

Procedures, training, continual improvements, bench-marking, metrics-tracking, verification and validations are all components to an auditable program. All waste and recycling data are submitted to our third-party vendor who compiles our data and presents its findings in reports, charts, as well as an on-line Dashboard Program for easy and up-to-date monitoring. We recommend medium sized businesses throughout the world start with small measurable goals and build upon successes, while paying attention to lessons learn from defeats.

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