SAGE CLC Submission

EcoStream

Lower Impact, Lower Price – **Soda Evolved**

http://www.sodaevolved.com

Confidential

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April 08, 2009

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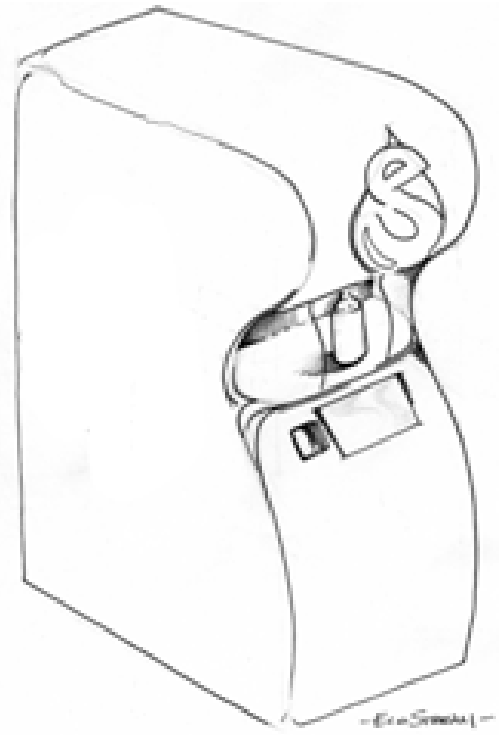


Executive Summary

We present EcoStream, an advanced vending machine set to tackle the environmental challenges facing the beverage market. EcoStream features the packaging, location, and convenience of a vending machine with the cost, benefit, and variety of a fountain drink machine. Through a novel combination of technologies, EcoStream removes the creation and disposal of plastic and aluminum containers by allowing customers to fill their own bottle. By offering a variety of products, including powdered drinks, juice products, and flavored water, EcoStream targets market segments typically unreached by vending machines, including consumers who are health, price, and consumption conscious.

EcoStream will capitalize on the consumer and governmental backlash towards excess waste produced with bottled water by dispensing product directly into the customer's container. Beverage consumers are shifting away from regular carbonated soft drinks towards diet, energy, juice and flavored water. EcoStream will capture this new market segment by offering them a product that is both eco-friendly and health-conscious.

EcoStream is working with professionals in engineering and business, retaining Glenn Bower, PE PhD ME, and Dave Kruse, MBA, as business advisors. With their assistance, EcoStream has created a working prototype that claimed first place in the Schoof and Tong Invention Competition, impressing judges with its sustainability and its market appeal. EcoStream pulls from three separate revenue streams: placing and operating EcoStream vending machines, branded eco-friendly RFID embedded stainless steel bottles for our cashless payment system, and targeted advertising space on the machine touch screen and website.

Each EcoStream machine will collect between $12,180 and $28,787 annually, with 30 to 75 daily sales. Although the retail price of our product is 50 cents lower than competitors' pricing, profits on EcoStream machines will exceed those in current vending machines due to the cheaper costs of bag-in-box bulk syrup and less frequent machine stocking. Depending on usage, each machine will yield net profits between $7,884 to $19,186 dollars annually at a 58% margin. The cost to manufacture an EcoStream machine is projected at $2,000 dollars, with all parts already available on the market, paying for itself in just 3 months.

Not only are EcoStream machines cheaper to operate, but these machines also consume 40% less energy than the newest vending solutions by major manufacturers. A fleet of EcoStream machines with 0.5% US market penetration saves enough electricity per year to shut down two UW Charter St. power plants. This same set of machines remove the need to manufacturer enough PET bottles to supply the country of Greenland with oil for an entire year. EcoStream presents a new type of "green" technology: one with a payback period.

Lower Impact, Lower Price – **Soda Evolved**

Climate Change Problem

EcoStream sets out to tackle the environmental challenges facing the beverage market. EcoStream is a product designed for use on the United States national market as a climate change mitigation. By addressing the issues of shipping, stocking and distributing beverages in a more efficient manner, EcoStream eliminates waste and reduces industry overhead on soda production. The beverage industry has a serious challenge in addressing today's consumers who are concerned with their environmental impact and the affordability of goods. EcoStream reduces environmental impact and sells vended beverages for less.

The cumulative energy usage in the traditional vending industry is staggering. Oil is required to make syrup, transport the syrup, make the PET bottles, transport the PET bottles, fill the PET bottles with a syrup and carbonated water solution, and then to truck those billions of bottles to vending machines around the country. By the time this distribution is taken into account, the Earth Policy Institute estimates that 5 ounces of oil are used to produce a single bottle of Coke. (Pacific Institute) Finally, by the time the PET beverage reaches its destination, it must be refrigerated in vending machines. On average, standard glass front vending machines consume 11.25 kWh per day, or around four 100 watt incandescent bulbs running 24/7. Furthermore, once purchased and consumed, recycling rates for PET bottles average only 23%, plummeting to 13% in non-deposit states. The environmental footprint of the convenience driven vending market is massive.

EcoStream addresses the cause of environmental change by mitigating the amount of energy used in producing beverages for vending. Additionally, EcoStream will further reduce the impact of bottlers on their local watersheds by distributing the water load to each EcoStream machine, reducing the risk of localized drought from overconsumption. The U.K. government predicts that by 2030, fresh water reserves around the globe will be in danger of drying up.(Sample) Currently, bottlers draw water from watersheds in regional plants throughout the US to create bottled beverages. The communities in these bottling locations are directly affected by this usage with more drought prone watersheds, yet continue to sacrifice the environment for the economic benefit of having a bottling plant. (Srivastava)

EcoStream is the 21st century answer to the vending machine, with customers providing their own bottles to purchase locally created, quality sodas with a substantial reduction in environmental impact. EcoStream significantly reduces fuel usage, eliminates PET bottles, and distributes water load to create a revolution in the beverage vending industry.

Project Concept

EcoStream and Product Description

The fundamental shift behind EcoStream is that customers bring their own bottle to get the same quality beverage that they would normally purchase from a traditional vending machine. EcoStream will offer an increased convenience with cashless payment, taste customers expect, and a lower cost.

EcoStream is the combination of a traditional soda fountain dispenser and a computer, coupled with a system to accept cash and credit or debit payments through an online account system.

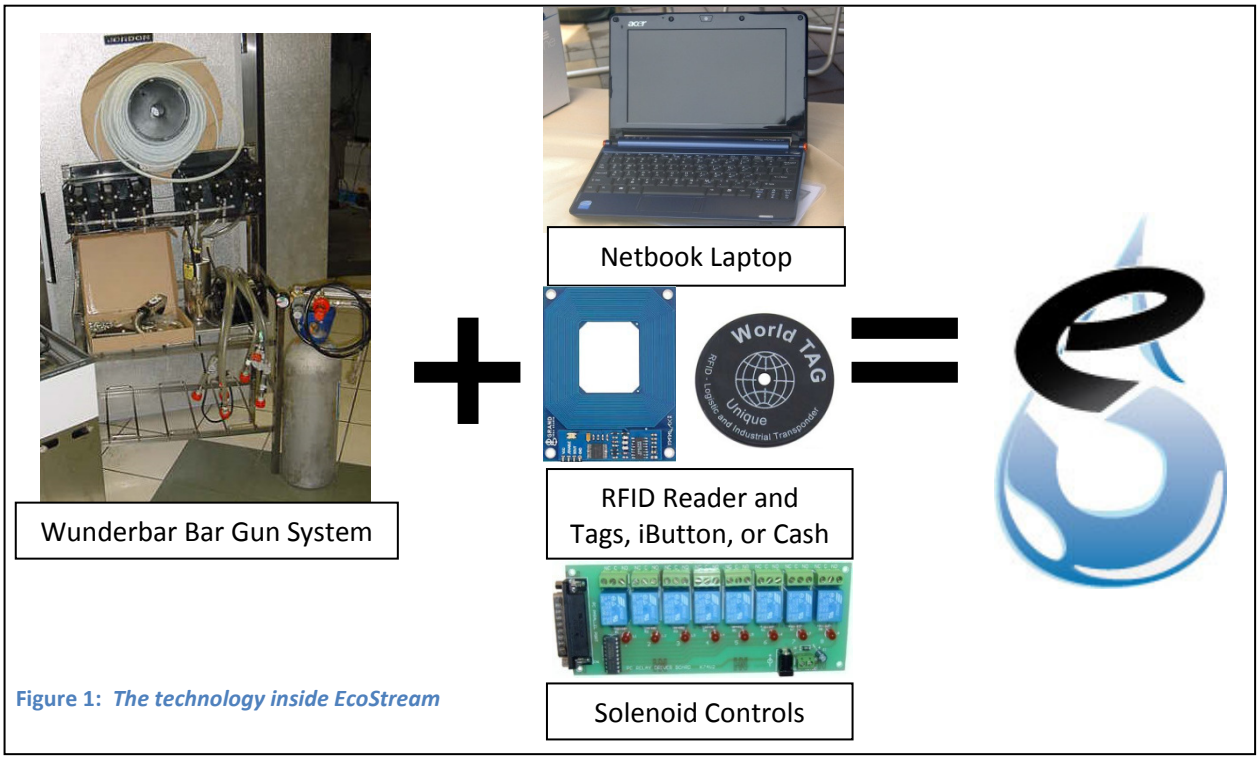


Figure 1: *The technology inside EcoStream*

EcoStream utilizes bag-in-box syrup, where the soda is generated by combining carbonated water and syrup (or powder/juice concentrate) in the machine using technology already present in every restaurant across the US. In Figure 1, this existing technology is combined with controls and internet connectivity of a low power laptop coupled with multiple payment systems to create an EcoStream vending machine. The only modifications necessary to a restaurant style soda fountain is rotating the nozzles to face each other and direct that flow down a single dispense nozzle. This repositioning allows EcoStream to mix up to four flavors (currently implemented and working) of beverage concentrate and carbonated or non-carbonated water. In order to dispense the correct quantity of beverage, these valves are controlled by the laptop that regulates the amount of time the specific flavor valve stays open. This feature allows EcoStream customers to custom mix flavors automatically with the touch screen interface. Finally, the laptop is connected to an electronic or traditional cash payment scheme, allowing it to accommodate any credit or cash payment.

Prototype

EcoStream was built and is a fully functioning prototype as of February 9, 2009 for the Schoof and Tong Prototype competitions. The invention took first place in the Tong Prototype prize, third prize in the Schoof's Competition, and also the Younkle Best Presentation award for a total of $7500 in prizes. This initial prototype was torn down and rebuilt with a full Wunderbar cooling, carbonating, and pump system. The next modification was the addition of two Wilshire soda valves. These each host two flavors and are set up to allow for a mixing of four flavors into one drink simultaneously. This version of

EcoStream will be available during the second round presentation at the 2009 SAGE competition. Future additions to the machine are a fully capable web-enabled touch panel display and powdered drinks.

EcoStream is also coming to the internet at www.SodaEvolved.com. This website explains what EcoStream is and where it is available to potential customers visiting from the internet. It will highlight the environmental impact of traditional bottling and offer information for visitors to present to their employers about their impact on the environment by using traditional vending machines. EcoStream is working with the Wiscard office and the Wisconsin Union for possible placement in the new Union South currently in early stages of construction.

Unique Features

EcoStream features many improvements over a traditional vending machine. Customers using the machine are able to create their own drinks on demand, much like Kwik Trip stores have been pushing for many years, simply by mixing a variety of base flavors and popular brands by hand. With an EcoStream machine, a customer can use the computer interface to build their drink by simply sliding selectors on the screen to balance the flavors. The drink is then automatically dispensed and the customer can be on their way. If they enjoyed their creation, they can log in to www.SodaEvolved.com and save the combination (which was automatically stored to their account) as a favorite. Now whenever they visit any EcoStream machine, their account will recall the drink and if the flavorings are available, the drink can be accurately recreated, as shown in Figure 2. If the customer wants to share this drink with their friends, they can easily send a link that will add the drink to their accounts to try out. If a custom mixed drink is very popular, the syrup manufacturer could easily spin it into its own flavor.

Figure 2: ***A Sample User Interface***

EcoStream also features a number of customer-centric nutritional/consumption features. Since the machines are all networked to a server, they can easily gather user statistics and present them to customers, such as tracking individual environmental savings by using an EcoStream machine, calorie consumption, and health information. Furthermore, if the customers are only drinking from an EcoStream machine, their hydration could be gauged, and advice given on whether they are drinking enough to remain healthy. These interactions with the customer can help make people healthier and happier, a value added service provided with no overhead by EcoStream.

Opportunity

EcoStream is entering the mature cold beverage vending market. Cold beverage vending sales totaled over $6.4 billion in 2007, with a 6.7% annual increase. (Mintel) Three multi-national corporations hold more than 80% of all sales, Coca-Cola, PepsiCo, and Cadbury Schweppes. They provide Carbonated Soft Drinks (CSD), ready-to-drink teas, juices and bottled water to the Echo Boomers and the Matrix Generation (collectively those under 35), who are the primary vending consumers. Mintel reports that 67% of those under 34 consume vended beverages frequently.

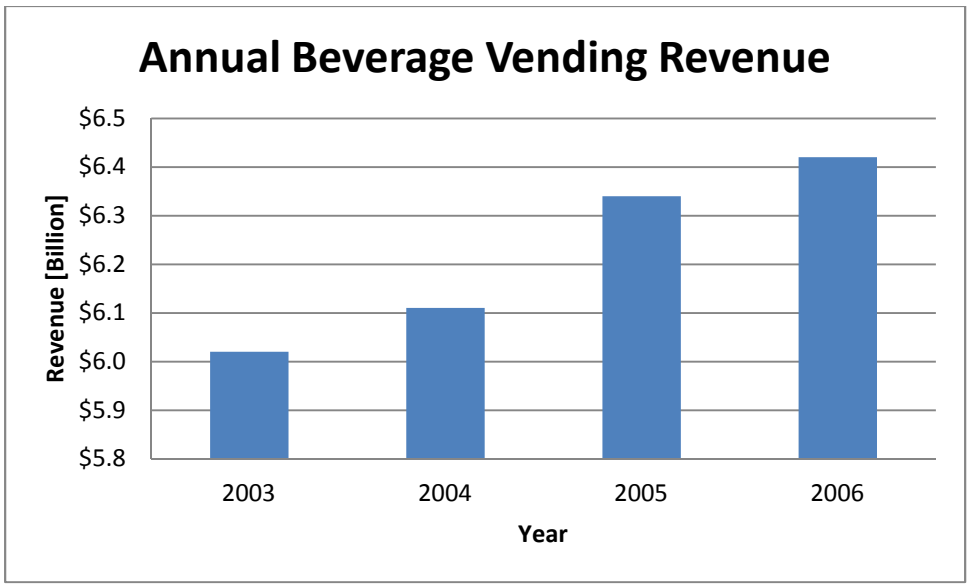


Figure 3: *Annual Revenue from Cold Beverage Vending Sales.* (Mintel)

The market for new vending machines is continually growing. On average, vending machines are replaced or refurbished every 6 years, with over 11 million vending machines worldwide. Over 2.6 million machine are located in the United States alone. (The Cadmus Group) These machines operate at a 30% - 40% profit margin, depending on sales volume and lease agreements.

Background Review

EcoStream is merging into vending as the industry is open to change. EcoStream will capitalize on:

- The push to make vending machines environmentally friendly
- The backlash to bottled water on a consumer and governmental level
- The economic slowdown
- The declining popularity of traditional carbonated soft drinks

Coca-Cola and PepsiCo spent millions of dollars to modify existing vending machine technology, making it more environmentally friendly. PepsiCo debuted their new, top performing model on March 30, 2009, which champions a 15% increase in efficiency over conventional vending machines, using only 5.08 kilowatt-hours per day - equivalent to two 100 watt bulbs on all day. (Geller) EcoStream currently uses even less energy, at only 3 kilowatt-hours per day, a significant improvement over this recently developed PepsiCo machine! Coke poured $40 million dollars into 8,000 vending machines called "eKOfresh," that use CO2 as a refrigerant instead of R134a, perceived as being less greenhouse gas emitting on reclamation. (Gunther) All of this effort from Coke and PepsiCo is an attempt to "green" their corporate image and resonate with the young adult market segment. EcoStream can garner these benefits and more, with much less of an investment, by simply replacing machines as they age out of use.

Bottled water is under intense scrutiny as an environmentally irresponsible beverage because of the waste generated from the throwaway nature of the product. This backlash came in the form of consumer outrage and resulted in government and institutional action, banning the use of government spending on bottled water in many cities across the US. Mintel reports that 18% of customers have stopped buying bottled water due to environmental concerns.

- Mayor Gavin Newsom of San Francisco signed an executive order banning the use of city funds for purchasing bottled water.
- Mayor Rocky Anderson of Salt Lake City ordered city firefighters to stop bringing bottled beverages on fire calls. Instead, each firefighter had been issued a metal ten-ounce "refillable container." (Earth Policy Institute)
- The City Council of New York has shifted to tap water instead of bottled water.
- Other cities including Orlando, Seattle, and Ann Arbor have followed suit in banning bottled water purchases with city funding. (Sundaram)
- Washington University in St. Louis has banned bottled water across the entire campus. (Woznica)
- See Figure 4 for an example.

EcoStream will exploit this shift away from plastic bottles by letting customers fill up with their own bottle at our machines. In addition, since water is included in most location agreements, EcoStream will have very little cost to generate the filtered/flavored water aside from $10 water filters requiring annual replacement.

Figure 4*: Ban the Bottle Poster. Source (Schuster)*

Environmental and Social Impact

In the time it takes to read this sentence (3 seconds) 6,849 PET bottles have been created just for beverages. Every year Americans fill up 34 Empire State Buildings with PET bottles. (Wonderclub) The beverage industry in America contributes to climate change by producing, transporting, and storing over 156 PET bottles per capita each year, with 72 billion PET bottles capable of running 7 million cars annually. (Verespej) (Clark)

EcoStream will change the environmental impact of the beverage vending industry. Our objective is to move the industry towards carbon neutrality by removing needless shipping, replacing PET bottles with re-useable stainless steel bottles, and finally reducing the electricity consumed by each vending machine. The impact of EcoStream machines is huge, judging on overall energy usage, water usage, and emissions of each beverage sold and multiplying by the EcoStream adoption rate. We project EcoStream at a 0.5% market share by revenue by 2015, in the $6.4 billion dollar vending industry. At this market penetration, we will displace approximately 8.25 million PET bottles at 75 sales per day per machine. This equates to saving 4,251 barrels of oil daily, enough to run the entire nation of Greenland. (Central Intelligence Agency) (Larsen)

Distribution Path

Currently, distributing beverages across the country is heavily reliant on truck transport from the syrup producers, bottlers, and finally into the retailers, who then sell the product to vendors who stock the machines and ultimately profit on soda sales, as shown in Figure 5.

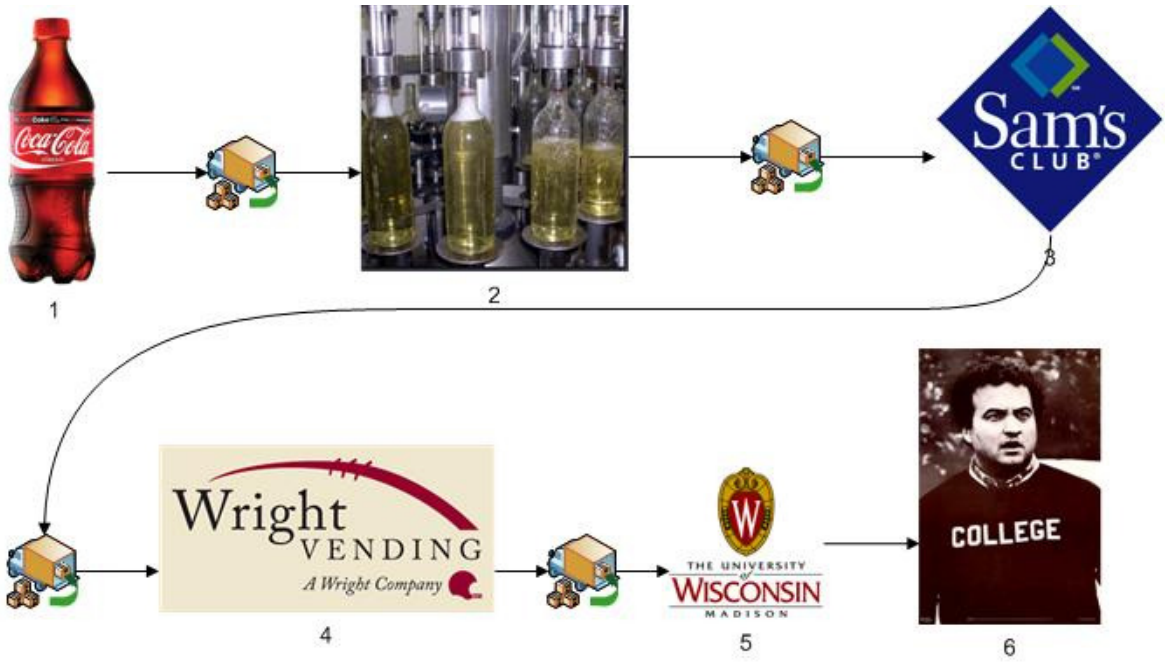


Figure 5: *The Distribution Path Taken by a Traditional Vending*

Earth-policy.org reports that approximately 1/3 of all bottled water has crossed a national border before it reaches the consumer. (Larsen) EcoStream allows major companies such as Coca-Cola and PepsiCo to cut out the bottlers and distributers and use a much simpler distribution path to stock individual EcoStream machines. A depiction of this path is in Figure 6.

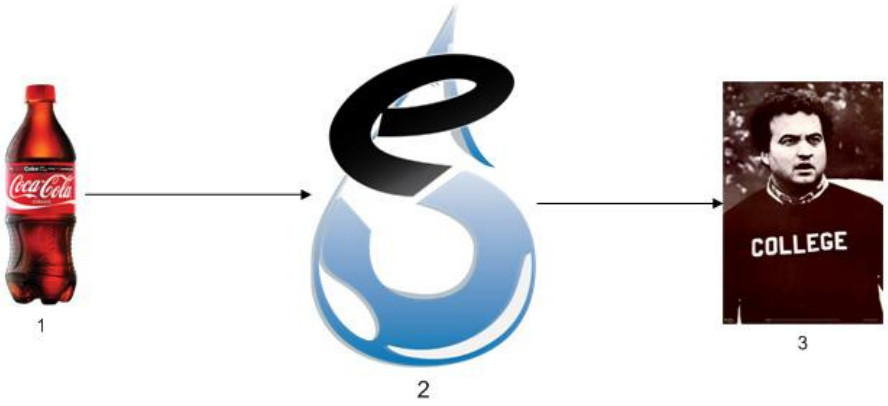


Figure 6: *The EcoStream Distribution Path*

The fuel savings from this improved distribution model is difficult quantify, as it is not known how far each bottle travels before it reaches the consumer. Additionally, EcoStream features bag-in-box sodas, which come in a concentrated mix of syrup which is diluted with 5.5 parts water, allowing 5 gallons of syrup to serve over 25 gallons of soda, reducing the required trips by the vending machine stockers from a bi-weekly occurrence to weekly at the most. This saves three trips per week worth of fuel and emissions to the each vending machine.

PET Bottles

PET bottles pollute the environment, cost energy, water, and are made of oil. In 2007, the recycling rate for PET bottles was only 23% , meaning that 67% of 72 billion bottles ended up in landfills across the country. (Container Recycling Institute) The end result of this consumer negligence is that these bottles sit for over 1,000 years leaching BPA and other chemicals into the surrounding watershed while they slowly degrade, creating a hazard for many years to come. (Brita and Nalagene Corp.) EcoStream will mitigate this problem by reducing the need to manufacture PET bottles for vending customers, who are more likely to trash used bottles because they lack proper recycling collection when on the go.

Furthermore, there is backlash against the bottled water because of the waste that is created as a result of bottling water and selling it. EcoStream plans to follow the example of many companies, governments and concerned citizens by getting behind the "Think Outside the Bottle" campaign, which promotes consumers to consider their impact when purchasing bottled water. New York City and Seattle are banning bottled water from the city budget, cutting expense and environmental waste simultaneously, however there is no current replacement which removes PET from the solution, which is where EcoStream fits in. Even if all PET bottles were to be recycled, they would still have to be processed, incurring further environmental penalties. EcoStream will take advantage of the void left by bottled water backlash, offering this underserved market the opportunity to still get the beverage they desire at a fraction of the cost and environmental penalty.

Figure 7*: Bottled Water Consumer Backlash Poster. Source: (Tappening.com)*

In addition to saving oil, EcoStream will also eliminate the carbon emissions that result from the manufacturing of PET bottles. In 2006, emissions from PET bottles totaled 2.5 million tons of carbon dioxide, or the equivalent of a 500 MW power plant. (Wikipedia) (Tappening.com)

Water Consumption

EcoStream will enable the transition from a centralized water bottling model to a localized distribution channel. Since bottlers currently draw huge amounts of water from one area of the country, and ship it to the rest of the US, they cause well documented localized droughts. The reduced impact will benefit both bottlers and environmentalists alike, as corporations will not have to spend as much on legal fees and "greening" of their image and consumers will not have their favorite fishing holes drained. In 2007,

Poland Springs bottled water company was removed from Fryeburg, Maine after causing the local ponds to discolor and lose marine life. (Fahrenthold)

Point of Sale Energy Consumption

Finally, at the last stage of vended beverages, companies prominently display their bottles and cans behind clear glass panes to boost sales. Although this glass is good for marketing, it is an inefficient way to insulate the refrigerated air. The PepsiCo vending machine in the UW Engineering Centers Building consumes 11.25 kWh per day, about what four 100 watt light bulbs burn running continuously. In contrast, the working EcoStream prototype only consumes 3 kWh per day, a 73% decrease in power consumption. At 0.5% market share, EcoStream machines conserve enough electricity to take the equivalent of two Charter St. powerplants off the grid.

Financial Feasibility

Revenue Streams

EcoStream will capitalize on three separate revenue streams: EcoStream vending fleet management, selling RFID embedded stainless steel bottles and selling targeted advertising space on the touch screens/website. Individual EcoStream vending machines will collect between $12,180 and $28,787 annually with 25 or 75 sales per day respectively. Typical vending machines range from 20 to 150 sales per day, so these are reasonable projections for a new machine requiring more customer planning, but with significantly cheaper prices. These projections are analyzed in Appendix E.

Each fill of a bottle is a 16 oz beverage, however, the machines can be set to either dispense this quantity or only as much as the user desires, charging them appropriately. The cost per fill could be adjusted remotely and as sales are monitored, prices can be adjusted if needed. Since vending purchases are typically only a couple of dollars, the difference in price by a few quarters can make or break a purchase. EcoStream will launch by offering the same quality beverage for 50 cents below the expected cost of a bottle from a traditional vending machine. Table 1 below breaks down the source of revenue per EcoStream machine. Category sale percentages are in line with data obtained from the *The Daily Scoop* at Memorial Union as well as data taken from Mintel reports on the beverage industry; all data is presented in Appendix E.

Table 1: *The EcoStream Selling Price of a 16 oz Fill and Respective Sales per Beverage Category*

	Cost Per Fill	% Discount	Low Volume	High Volume
Soda	$1.00	33%	13.75/day	41.25/day
Energy Drinks	$2.00	33%	2.5/day	7.5/day
Filtered Water	$0.75	50%	8.75/day	26.25/day
Total Sales			25/day	75/day

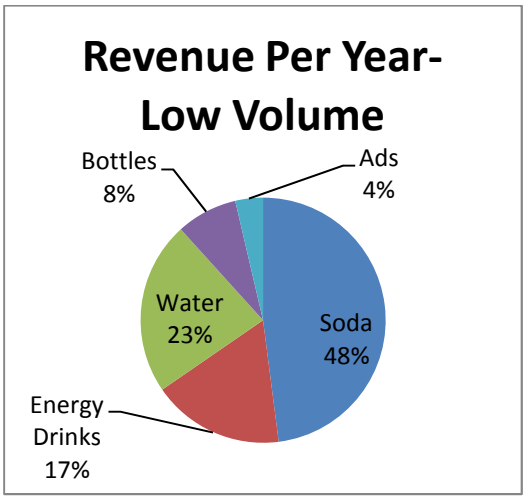
Advertising projections are tabulated using standard internet values for non-targeted advertising of $0.25 per click. EcoStream expected ad revenues will cost advertisement firms 25 cents per exposure to our customers when they interact with a machine. 25 cents is a conservative number as EcoStream will be able to automatically stream ads to machines based upon individual demographic information which often garners more revenue per impression in the internet advertising model. This targeted advertising, where the advertiser is aware of the user's preferences and can aptly target an ad at their demographic is the up and coming model in internet advertising. Targeted advertising has been successfully utilized by companies such as Pandora Internet radio and when Microsoft teamed with Mountain Dew to launch Halo 3 with "Game Fuel". In addition to on machine advertisements, advertisements will also be present at www.SodaEvolved.com as our customers are managing their accounts and creating custom drinks.

Additionally, EcoStream will sell branded bottles with embedded RFID tags, allowing use with our machines for wireless automatic payment. We foresee bottle sales as a small percentage of overall revenue in part because customers can still purchase an RFID tag for $3 that can be incorporated into their wallet or on their bottle they already own. We project at least 50 RFID enabled bottles sold over our web site per every machine sold. Each of these bottles will be sold at little margin for EcoStream, however the overall effect of reinforcing customer ease of payment and our branding as trendy and environmentally friendly will make an impact on our customers and those around them. Furthermore, because the internet linked EcoStream machine can take payment directly from these bottles, our customers can forget about change, just bring your bottle and enjoy your purchase. We foresee sales at $20 per RFID enabled bottle in low quantity.

When a business is interested in partnering with EcoStream to boost their image, "Go Green" sponsored bottles can be purchased for employees along with an Ecostream machine to replace traditional break room machines. S.C. Johnson already has a program similar to this; however, they use large coffee mugs rather than the current trend of Nalgene or stainless steel style bottles and do not have a machine for employees to use.

Expected Revenue Per Machine

Vending machines sales are monitored by the number of items sold per day. Reading through industry sales figures, environmental studies, and observing vending machine use at UW allows us to figure two usage projections, a low volume case with 25 vends per day and a high volume case with 75 sales per day. Analyzing the low volume case, we find that $12,180 annual revenue is expected per machine.



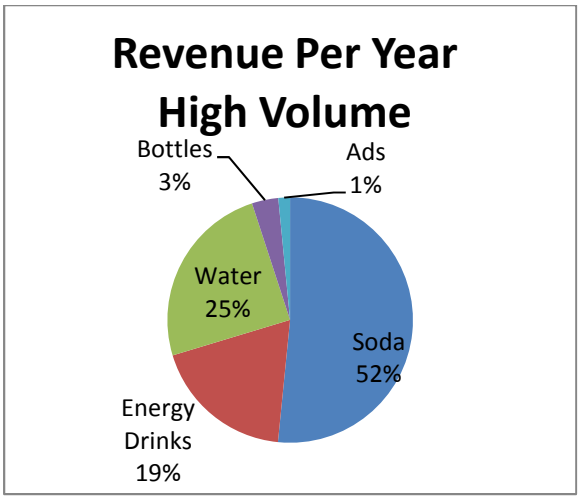


Figure 8: *Projected Low Volume Revenue per Year*

Figure 9: *Projected High Volume Revenue per Year*

The projected high volume revenue is calculated using 75 sales per day, industry numbers report between 100 and 150 sales per day in many areas, however our research showed this is likely conglomerated data from adjacent machines. Revenue for a single EcoStream machine is expected to reach a high of $28,787 dollars per year per machine.

Profit Margin

EcoStream was invented foremost for the great environmental factors and secondly for the large profit margin that bag-in-box syrup technology delivers. For profit projections, water is included in the price of rent so it is not additionally accounted for. Also included in the rent and overhead is the CO2 charge required to run the machine and carbonize the water since a single 5-pound bottle ($20) will create 100 gallons of soda.

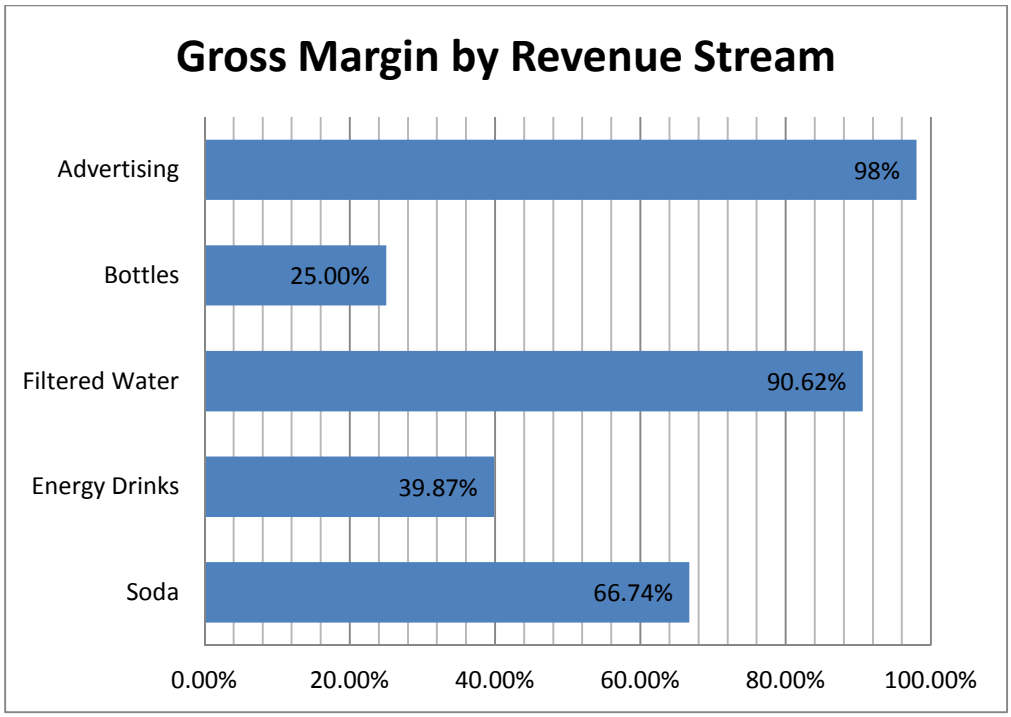


Figure 10: *Gross Margin by Revenue Stream*

Noteworthy in Figure 10 is the large margin in advertising and filtered water from nearly no overhead that is required. CSD and energy drinks are limited in their profit margin by the distribution provider. If one of the major syrup manufacturers were to acquire and implement this technology and use the syrup they produce, cutting out the distributers and big box stores, these segments would see a substantial margin increase.

The raw monthly profit per month is listed below in Table 2. These projections are calculated based on a vending machine placed in the University of Wisconsin, as outlined above, sales are dependent on location and convenience.

Table 2: *Monthly and Yearly Profit*

Monthly		Yearly	
Low Profit	High Profit	Low Profit	High Profit
$648.66	**$1,598.84**	**$7,783.92**	**$19,186.05**

Market Share

EcoStream plans on gaining markets share in the college systems by setting up contacts with schools that want to project a green image. The University of Wisconsin currently has 440 beverage vending machines on campus totaling an annual revenue of $1.4 million dollars. We are currently in talks with the University of Wisconsin to set up such a deal. Other schools, such as the Washington University in St. Louis, may be even more receptive to EcoStream technology after ending bottled water sales across the campus. (Daues)

As a start-up it is difficult to gauge the impact EcoStream will have on a mature $6.4 billion dollar industry. The best scenario for introduction is into the UW system, with at least 15 machines. This would give EcoStream nationwide recognition in the beverage vending industry. In 5 years, projections indicate that EcoStream could easily manage a fleet of 600 machines, with a revenue of $4.8 million dollars and market share of 0.08%. A fleet of 600 machines is achievable in any medium sized city, i.e. Wright vending operates at $11 million annual revenue with 440 machines on campus alone.

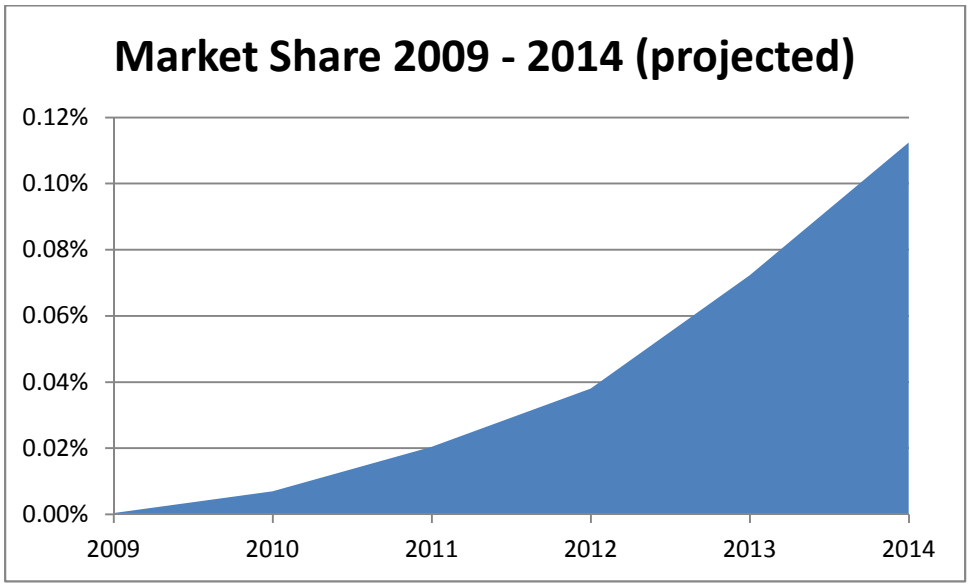


Figure 11: *Market Share Projections for EcoStream 5 Year Plan*

Growth

The beverage vending industry has a 6.7% annual increase. EcoStream is expected to grow along with the industry, however because of the clear advantages EcoStream has to offer and our low starting point we predict a CAGR of 2.08% In Figure 12 below, net revenues are plotted over the next five years.

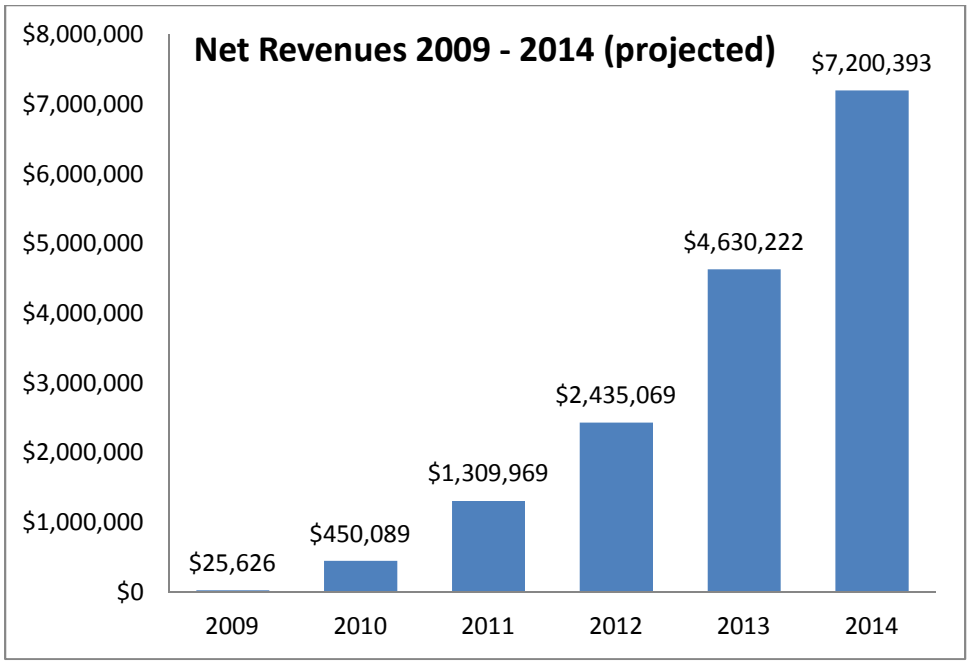


Figure 12: *6 Year Net Revenue Projections*

EcoStream plans to take strategic expansion initiatives over the five year plan in order to achieve these large growth rates. EcoStream is partnering with Madison based Flatt Cola to produce an automatic beverage mixing counter top unit. Also, EcoStream will work to acquire several contracts with universities, government buildings, and eco-conscious companies to distribute our services.

Marketing

There are currently three large beverages competing for the $6.4 billion dollars of cold beverage vending revenue. These companies, Coca-Cola, PepsiCo and Cadbury Schweppes dominate the beverage market with a combined market share illustrated below in Figure 13. Additionally, beverage manufacturers such as Coca-Cola and PepsiCo have established presence worldwide, operating a combined 11 million vending machines in nearly every country in the world. (Gee)

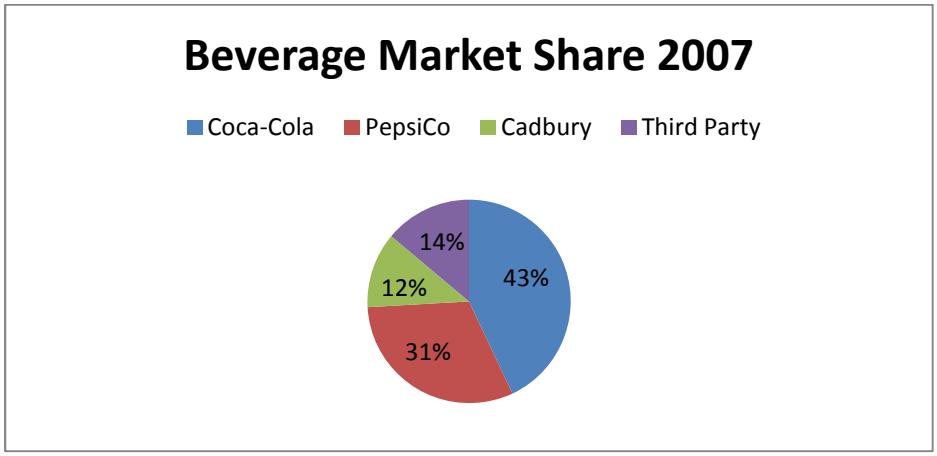


Figure 13: *Carbonated Soft Drink Market Share 2007. Source: http://www.beverage-digest.com/pdf/top-10_2008.pdf*

Sales and Distribution

EcoStream follows the traditional vending beverage distribution network as outlined in Figure 14 below. The national beverage manufacturers operate, design, and pay for manufacturing of beverage equipment including bag-in-box, post-mix and vending equipment. These manufacturers also create their syrups to sell to bottlers, who then mix the syrup with water regionally and sell it to major suppliers and warehouses for all the stores in the US. The vending companies, such as UW Madison's Wright Vending, purchase their stock from a wholesaler like Sam's Club. Wright Vending is in a contract with the University of Wisconsin as one of several vending providers. Wright then places 440 machines on UW's campus and sells beverages and snacks to college students, generating over $1.4 million dollars in revenue annually from UW alone. EcoStream seeks to build and maintain these distribution channels and ease into the vending industry with a new twist on classic vending.

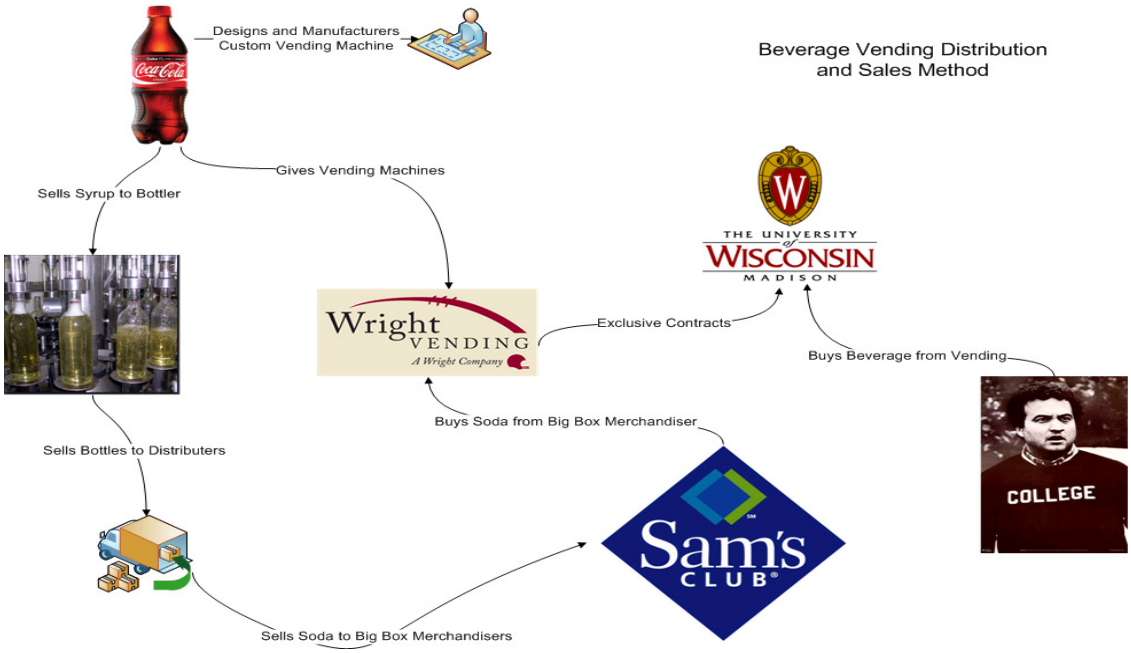


Figure 14: Traditional Beverage Vending Sales and Distribution

Customer

EcoStream will enter a highly profitable customer demographic of Echo Boomers and the Matrix Generation (those under 34), of which 67 percent purchased from a vending machine regularly in 2007. (Mintel) This includes a growing population of K-12 and college students who rely on vending products daily for meals and convenience products. The student populations are key early adopters because they:

- Often use a reusable container
- Prefer cashless transactions
- Are eco-conscious

- Have nearby vending machines at work or school
- Are price-conscious
- There are 39 million high school and college students in America
- College students have a combined non-academic spending of $21 billion

Moving beyond students, the overall vending machine demographic is well defined by age. As shown **Error! Reference source not found.**in Figure 15**Error! Reference source not found.**, as age increases ove 34 the usage rate of vending machines decreases quickly. Sex, marital status, and race do not play a significant role in determining vending machine usage. EcoStream will align itself with this demographic by providing cheaper services, more variety and a technologically advanced machine.

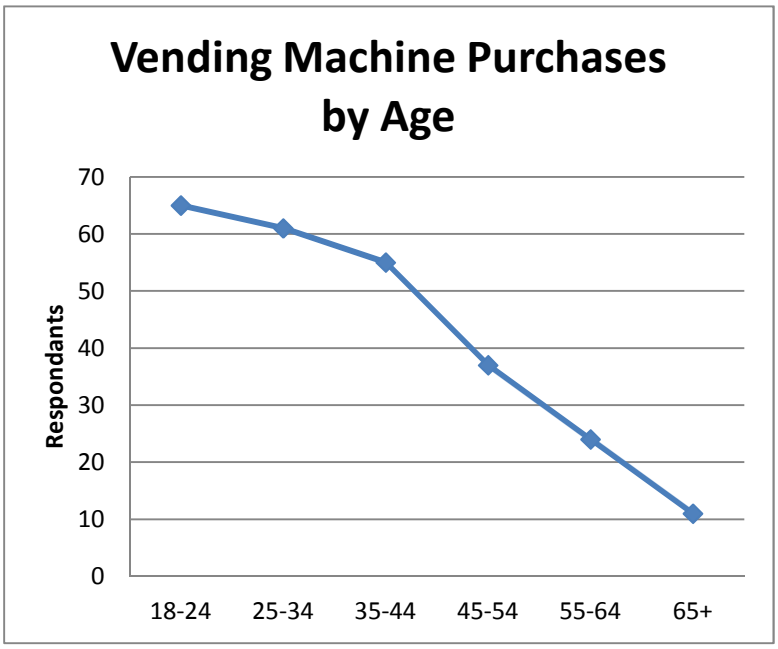


Figure 15: Number of respondents that use a vending machine. Source: Mintel Full Line Vending December 2007

Within the under 34 market EcoStream has identified some key segments where the appeal of an EcoStream machine will be amplified. EcoStream will be an attractive option to the 15.6 million Americans who have given up regular soda. According to Mintel, 62% of 18 – 34 year olds who use vending machines said they would use a vending machine more if it offered healthier options. (Mintel) EcoStream will also appeal to the 17.8% of Americans who are looking for a cheaper solution as current economics take hold. Finally, environmentalists will be early adopters of EcoStream machines. Consumer attitude towards plastic waste are shown in Table 3:

Table 3: *Concern for the environment and beverage purchasing. Source:* (Mintel)

	All	**18-24**	**25-34**	35-44	45-54
Buying **less** bottled water due to environmental concerns	16	**22**	**19**	16	15
Have **stopped** using bottled water to save on plastic waste	15	**18**	**18**	15	11

Customers under 34, who are key vending machine users, are also the most likely to make a purchase based on environmental merits. EcoStream will serve this market by giving them an alternative to purchasing bottles of water and soda, and aiding their conscious decision to support environmental sustainability.

Finally, the under 34 up and coming generations are accustomed to a single payment scheme, *cashless*. They are increasingly carrying only cashless payment, and therefore are unable to purchase from a vending machine even if desired, because current machines aren't capable of taking payment due to the high cost of overhead on every purchase, upwards of $0.25 + 2.5% of a transaction at the minimum. EcoStream will integrate the ability to charge transactions directly and effortlessly at our vending machine, but avoiding transaction fees by using our own account based system where customers deposit a minimum amount of $10. This allows customers to use the convenience of cashless payment, without the expense incurred by traditional credit card systems. These micro credit transactions, according to MasterCard, accounted for over $1.32 trillion in sales in 2006 and will only continue to grow. If vending machines are unable to utilize a plastic payment scheme soon, they will be outmoded.

Project Timeline

Please see Appendix H for a project timeline.

Challenges

Sanitation and Cleaning

EcoStream is not first unattended food or beverage vending machine. Coffee vending machines and standard fountain drink machines have been around for years and are designed with minimal sanitation and cleaning already in mind. Although unattended, EcoStream's connection to the internet gives feedback from users if the machine is dirty or not functioning correctly. If a customer is not satisfied with the EcoStream machine, they can use the machine to let us know and the computer controls can remotely order a cleaning. Cleaning of the bottle "stage" is easily accomplished using heated sprayers aimed at the walls and stage of the machine. All dirtied water then flows though a grate in the bottom of the stage and into the drain. Current vending machines utilize the building's cleaning staff to clean machine surfaces at least once a week already, so this service will remove any large residue that the built in sprayers aren't able to remove. Finally, when the machines are stocked they can be cleaned further each week.

Since all flavors in the EcoStream machine are dispensed from a single nozzle, there is a risk of taste contamination between uses with different flavors. To prevent flavor cross-contamination between customers, the machine controls discharge water that will clean the line and nozzle of any remaining flavor after a dispense. This system will assure a consistent flavor from the machine.

Water Bottles

EcoStream's innovative process is dependent on the customer to provide the container for our product. EcoStream would not be a replacement system for all vending machines, as some places are reliant on providing the customer with a container along with the product. Our projected market includes only schools and large companies where employees and students typically carry their own container. This market is proven by a study done in UC Berkeley, "I ♥ Tap Water", where a group of 813 students have exclusively used their stainless steel water bottles at an 80% adoption rate. (Edelstein) This

demographic is also supportive of our environmental stance and likely change their behavior to work with our product, especially for the cost savings. EcoStream's unique combination of cost savings and environmental stewardship will enable us to capture enough of the $6.4 billion dollar vending market to be a viable company.

Patents

We have to be careful with our intellectual property protection to position ourselves favorably for operation or acquisition. EcoStream is in the process of applying for a provisional patent. With patent protection we can position our technology to prevent competition and position our brand for a merger and acquisition from a major manufacturer.

Licensing

In patent search, we have come across several technologies that we require a license to run EcoStream, including patent "US 2008/0093444", with covers payment through RFID and near field communications. Additionally, the bar gun setup from Wunderbar is already a compact, self-contained unit which is easier to purchase than to recreate and license. (Automatic Bar Controls, Inc) Much of the existing IP in the vending market is well out of patent protection, often well over 40 years old, giving freedom to operate and build our brand recognition.

Name Brand Soda Flavor Usage and Distribution Methods

EcoStream will pursue a contract with a major beverage corporation such as Coca-Cola or PepsiCo in order to increase the profit margin. However, in the event that such a contract is not procured, EcoStream will purchase any bag-in-box syrup from large warehouse stores such as Sam's Club at a lower margin. Alternatives to using name brand syrup include going with third party manufactures, such as Faygo and store brands. These brands gained a 1% market share for the first time in 5 years in 2008 and certainly are not stagnate. (Mintel)

Team Biography

Founders

Mike Deau – Mike is graduating this May with a Bachelors in Mechanical Engineering. Mike took EcoStream to the first place in the Tong Prototype Prize and third place in the Schoof's Competition this spring for $7500 in prizes. He is currently the team leader for the Hybrid Vehicle team on the UW campus. Mike has worked for SC Johnson in the past on environmentally focused cleaning products. Mike is running the business aspects of EcoStream, LLC taking care of market research, web development, and graphic design.

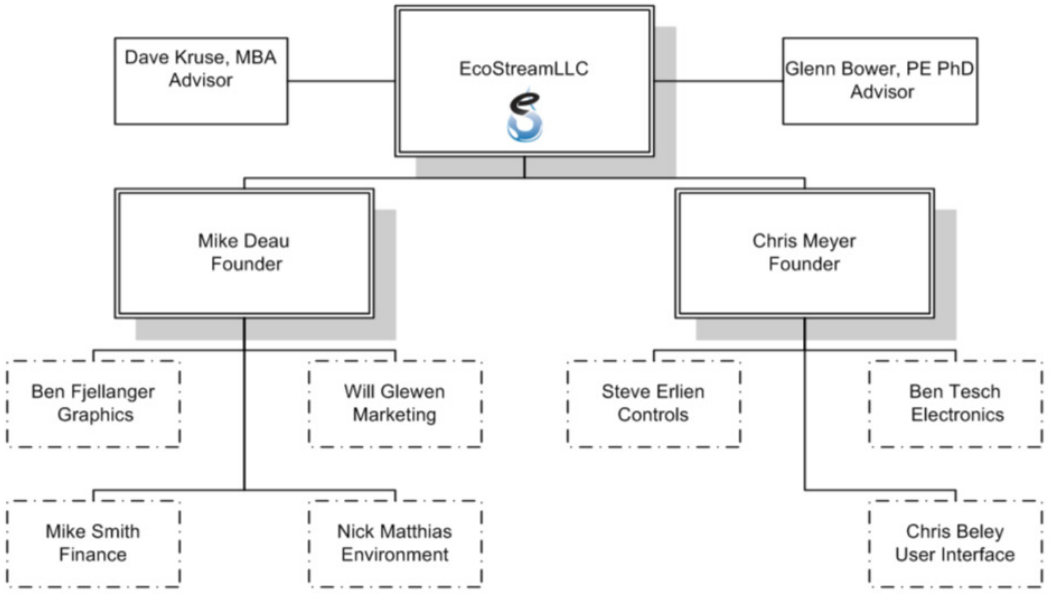
Chris Meyer – Chris is a Master's Candidate in Mechanical Engineering at the UW Engine Research Center. Chris is a 3 year competitor in the Burrill Business Plan competition, recently placing second place with Parallel Kingdom, a GPS based cell phone role playing game currently in the early stages of start up. He is also an alumni of the Schoof and Tong competitions, placing fourth. He is active on the Hybrid Vehicle Team, serving as an advisor. Chris is also a past organizer for the Engineering Expo,

building, designing and running the robotics competition in 2007. Chris is the lead technical developer for EcoStream, LLC coordinating the prototype development, controls, and electronics design.

Advisors

Glenn Bower – Glenn is a Professional Engineer with a PhD in Mechanical Engineering from UW-Madison. Glenn brings over 25 years of engineering experience in both widespread consulting and as the advisor for all 6 highly successful UW vehicle teams. Glenn operates a successful engineering consulting business, High Performance Engineering, LLC which specializes vehicle development with a focus on hybrid design and ground up development. Glenn is advising the engineering side of EcoStream, LLC.

Dave Kruse – Dave is the CEO and president Flatt Cola, LLC. He earned his MBA from UW in 2005. Dave has been crucial in sharing his insight into the beverage market distribution and revenue streams. Flatt Cola and EcoStream are teaming up on a joint venture to apply EcoStream technology to the mixed drink market.



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Appendix A – 2009/2010 Financial Statements

2009 Income Statement			
Gross Sales (Gross Revenues)		$	25,626
	Returns	$	-
Net Sales (Net Revenues)		$	25,626
	Cost of Goods Sold	$	16,529
Gross Profit		$	9,097
Gross Profit Margin (Gross Margin)			35%
Operating Expenses			
	Wages	$	46,567
	Utilities	$	1,333
	Insurance	$	1,750
	Advertising	$	-
	Travel	$	400
	Licensing	$	-
	Contingency	$	700
	Rent and Leases	$	5,129
	Service Vehicle	$	2,000
	R&D	$	-
	Total Operating Expenses	$	57,879
EBITDA		$	(48,782)
EBITDA Margin			0%
	Interest	$	-
	Taxes	$	-
	Depreciation	$	-
	Amortization	$	-
Net Profit (Loss)		$	(48,782)
Net Margin			0%

Appendix A – 2009/2010 Financial Statements

Monthly Cash Flow Projection

		Jan-09	Feb-09	Mar-09	Apr-09	May-09	Jun-09	Jul-09	Aug-09	Sep-09	Oct-09	Nov-09	Dec-09
Cash on Hand		$ -	$ 5,000	$ 4,925	$ 11,855	$ 7,060	$ 5,299	$ 28,021	$ 21,962	$ 22,004	$ 21,628	$ 19,253	$ 17,111
Cash Receipts													
	Equity	$ 5,000	$ 125	$ 8,000	$ -	$ -	$ 25,000	$ -	$ -	$ -	$ -	$ -	$ -
	Product Revenue	$ -	$ -	$ -	$ 1,015	$ 1,015	$ 1,015	$ 3,763	$ 3,763	$ 3,763	$ 3,763	$ 3,763	$ 3,763
Total Receipts		$ -	$ -	$ -	$ 1,015	$ 1,015	$ 1,015	$ 3,763	$ 3,763	$ 3,763	$ 3,763	$ 3,763	$ 3,763
Total Cash Available		$ 5,000	$ 5,125	$ 12,925	$ 13,885	$ 9,090	$ 32,329	$ 35,548	$ 29,489	$ 29,530	$ 29,155	$ 26,780	$ 24,638
Cash Paid Out													
	Wages	$ -	$ 200	$ 1,000	$ 4,200	$ 3,000	$ 3,167	$ 5,000	$ 5,000	$ 5,417	$ 5,417	$ 7,083	$ 7,083
	Operating Expense	$ -	$ -	$ 70	$ 267	$ 434	$ 784	$ 1,343	$ 1,243	$ 1,243	$ 3,243	$ 1,343	$ 1,343
	Machines Built	$ -	$ -	$ -	$ 2,000	$ -	$ -	$ 6,000	$ -	$ -	$ -	$ -	$ -
	COGS	$ -	$ -	$ -	$ 358	$ 358	$ 358	$ 1,243	$ 1,243	$ 1,243	$ 1,243	$ 1,243	$ 1,243
Total Paid Out		$ -	$ 200	$ 1,070	$ 6,825	$ 3,791	$ 4,308	$ 13,586	$ 7,486	$ 7,902	$ 9,902	$ 9,669	$ 9,669
Cash Position (EOM)		$ 5,000	$ 4,925	$ 11,855	$ 7,060	$ 5,299	$ 28,021	$ 21,962	$ 22,004	$ 21,628	$ 19,253	$ 17,111	$ 14,969

Appendix B – 2010/2011 Financial Statements

2010 Income Statement			
Gross Sales (Gross Revenues)		$	450,089
	Returns	$	-
Net Sales (Net Revenues)		$	450,089
	Cost of Goods Sold	$	249,492
Gross Profit		$	200,598
Gross Profit Margin (Gross Margin)			45%
Operating Expenses			
	Wages	$	51,367
	Utilities	$	1,333
	Insurance	$	1,750
	Advertising	$	83
	Travel	$	400
	Licensing	$	-
	Contingency	$	700
	Rent and Leases	$	75,233
	Service Vehicle	$	3,000
	R&D	$	-
	Total Operating Expenses	$	133,867
EBITDA		$	66,731
EBITDA Margin			15%
	Interest	$	-
	Taxes	$	10,010
	Depreciation	$	-
	Amortization	$	-
Net Profit (Loss)		$	56,721
Net Margin			13%

Appendix C – 2011/2012 Financial Statements

2011 Income Statement			
Gross Sales (Gross Revenues)		$	1,309,969
	Returns	$	-
Net Sales (Net Revenues)		$	1,309,969
	Cost of Goods Sold	$	546,009
Gross Profit		$	763,960
Gross Profit Margin (Gross Margin)			58%
Operating Expenses			
	Wages	$	136,400
	Utilities	$	6,000
	Insurance	$	10,000
	Advertising	$	15,083
	Travel	$	3,400
	Licensing	$	-
	Contingency	$	12,000
	Rent and Leases	$	266,689
	Service Vehicle	$	3,000
	R&D	$	-
	Total Operating Expenses	$	452,572
EBITDA		$	311,388
EBITDA Margin			24%
	Interest	$	-
	Taxes	$	108,986
	Depreciation	$	-
	Amortization	$	-
Net Profit (Loss)		$	202,402
Net Margin			15%

Appendix D – Media Coverage

College of Engineering Press Release:

weather-resistant, easily assembled modular emergency shelter that is large enough to house an entire family. Invented by electrical and computer engineering junior Jason Lohr.

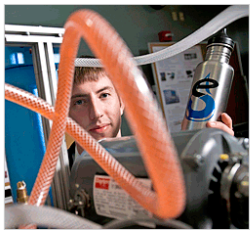
- Third place and $4,000— Eco Stream, a carbonated soft-drink dispensing system for a vending machine that offers users multiple payment options and enables them to fill their own reusable containers. Invented by mechanical engineering senior Michael Deau.
- Fourth place and $1,000—One-handed Canoe System, a set of devices that enables people with disabilities or physical limitations to paddle a canoe with one arm and carry the canoe more comfortably and easily during a portage. Invented by chemical and biological engineering senior Andrew Burton.

TONG PROTOTYPE PRIZE

- First place and $2,500—Eco Stream, a carbonated soft-drink dispensing system for a vending machine that offers users multiple payment options and enables them to fill their own reusable containers. Invented by mechanical engineering senior Michael Deau.
- Second place and $1,250—Portable Refugee Shelter, a portable, weather-resistant, easily assembled modular emergency shelter that is large enough to house an entire family. Invented by electrical and computer engineering junior Jason Lohr.
- Third place and $700—Split Key, a two-piece removable laptop

says Gartenberg, adding the technology will educate people about optimal sleep habits and could eventually be used to diagnose sleep disorders.

Additionally, a new type of soft-drink vending machine won first place and $2,500 in the **Tong Prototype Prize**, which rewards the best prototype in the competition. Developed by mechanical engineering senior Michael Deau, the Eco Stream system will integrate digital technology with environmental values, allowing people to reuse plastic or steel bottles and pay for their drinks via Web-based accounts.



Eco Stream, first place $2,500, Tong Prototype Prize; third place and $4,000, Schoofs Prize for Creativity; and $1,000, Younkle Best Presentation Award (*large image*)

The winners were selected from eight inventions developed by 10 students participating in the 15th annual Innovation Day, an event hosted on the UW-Madison College of Engineering campus. Innovation Day features two competitions that award cash prizes to the most creative ideas and the best prototypes. Additionally, participants can win money for submitting the best design notebook or delivering the best presentation.

Other Schoofs Prize for Creativity winners include:

Second place and $7,000— Portable Refugee Shelter, a weather-resistant, easily assembled modular emergency shelter that is large enough to house an entire family developed by electrical and computer engineering junior Jason Lohr.

Third place and $4,000—Eco Stream by Michael Deau.

Fourth place and $1,000— One-Handed Canoe System, a set of devices that enables people with disabilities or physical limitations to paddle a canoe with one arm and carry the canoe more comfortably and easily during a portage invented by chemical and biological engineering senior Andrew Burton.

Other Tong Prototype Prize winners include:

Second place and $1,250— Portable Refugee Shelter by Jason Lohr

Appendix E – First Hand Research

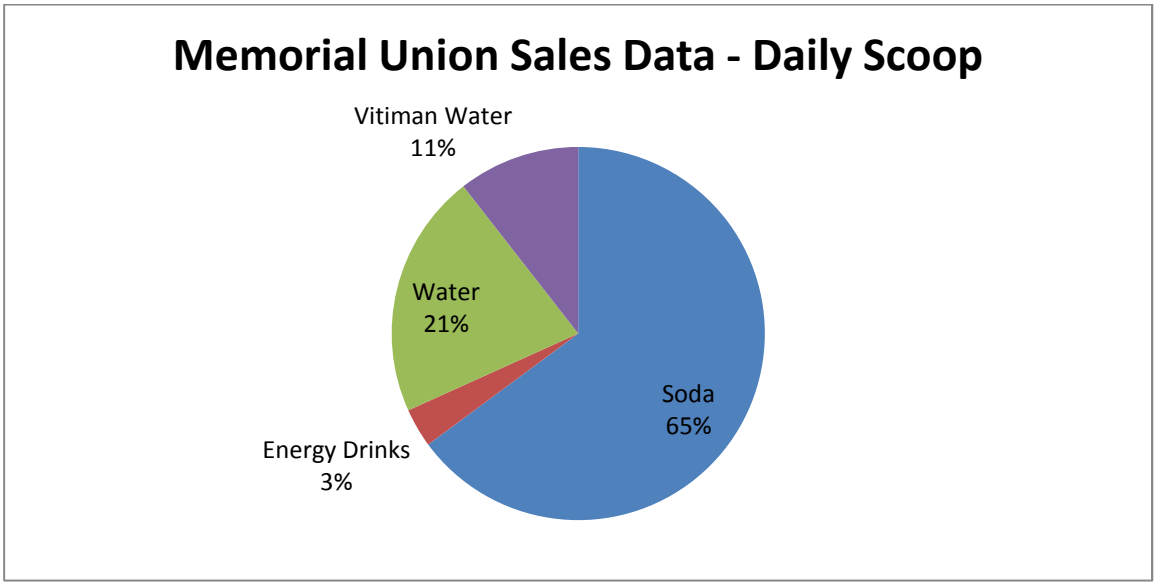
Engineering and Helen C Vending Yearly Sales

All green shaded sales had are beverage vending and are included in the calculations to the right.

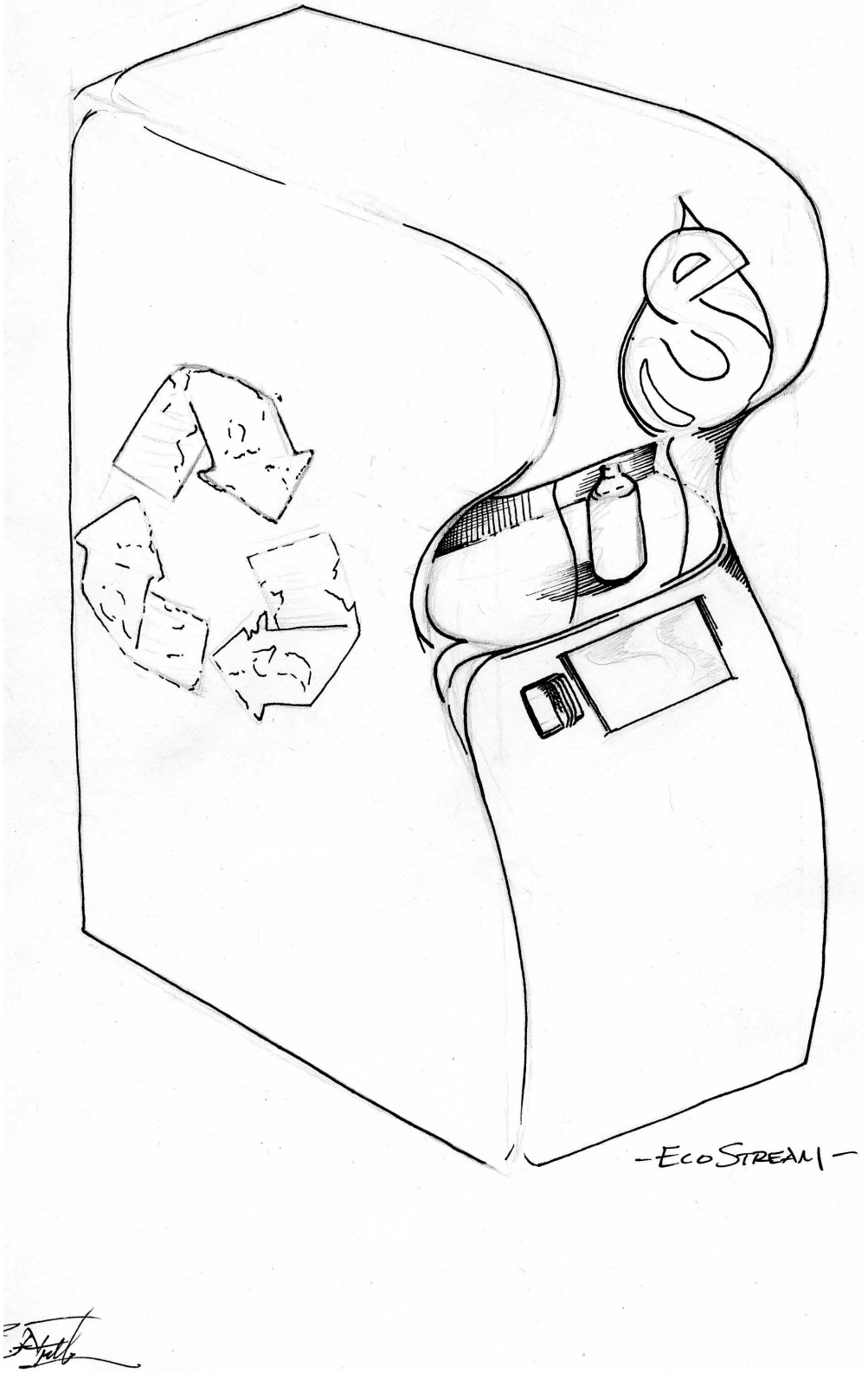
U.W. Electrical Engineering	Gross Vending Sales 7/1/2007-6/27/2008	
GF-Basement	8,710.55	**Total**
BS-Basement-Pepsi	670.40	**$ 18,669**
VC-Basement	1,367.60	**Average**
ECC-Basement-Pepsi	6,534.65	**$ 4,667**
CS/BS-Basement-7UP	3,690.35	
CS/BS--Basement-Pepsi	2,044.40	
BS-1st Fl-Pepsi	6,399.72	

U.W. Helen C. White	Gross Vending Sales 7/1/2007-6/27/2008	
GF-Left-1st Fl	$ 18,912.05	**Total**
CF-1st Fl	$ 3,902.60	**$ 113,197**
GF-1st Fl-Right	$ 27,146.43	**Average**
VC-1st Fl	$ 8,042.01	**$ 18,866**
ECC-Right-7UP	$ 37,353.37	
ECC-Right-Pepsi	$ 19,612.16	
BS-1st Fl-Left-Pepsi	$ 11,863.65	
CS/BS-1st Fl-Left-7UP	$ 13,216.91	
BS-1st Fl-Middle-Pepsi	*$ 10,563.11*	
BS-Right-Pepsi	$ 20,587.51	

Appendix E – First Hand Research (continued)



Appendix F – Prototype Concept Sketch



Sketch by: Ben A Fjellanger

Appendix G – Estimated Machine Costs

Parts	Qty	Wholesale Estimate	Cost	Extended		Wholesale
Refrigerator	1	$ 50.00	$ 100.00	$ 100.00		$ 50.00
Water Filters	2	$ 15.00	$ 20.00	$ 40.00		$ 30.00
Chiller Tank	1	$ 10.00	$ 25.00	$ 25.00		$ 10.00
1/3 Carbonator Motor	2	$ 50.00	$ 75.00	$ 150.00		$ 100.00
PROCON Brass Pump	1	$ 30.00	$ 100.00	$ 100.00		$ 30.00
PROCON Stainless Recirc Pump	1	$ 30.00	$ 100.00	$ 100.00		$ 30.00
Syrup Pumps	6	$ 15.00	$ 25.00	$ 150.00		$ 90.00
CO2 Tank	1	$ 30.00	$ 50.00	$ 50.00		$ 30.00
CO2 Regulator	1	$ 25.00	$ 45.00	$ 45.00		$ 25.00
1/4" Polyethylene Tubing	20	$ 0.05	$ 0.12	$ 2.40		$ 1.00
3/8" Polyethylene Tubing	12	$ 0.07	$ 0.15	$ 1.80		$ 0.84
Oetiker Clamps	10	$ 0.16	$ 0.25	$ 2.50		$ 1.60
Dispensing Nozzle	1	$ 150.00	$ 250.00	$ 250.00		$ 150.00
RFID Reader	1	$ 20.00	$ 50.00	$ 50.00		$ 20.00
Netbook PC	1	$ 250.00	$ 350.00	$ 350.00		$ 250.00
Housing	1	$ 100.00	$ 200.00	$ 200.00		$ 100.00
Hardware	1	$ 50.00	$ 50.00	$ 50.00		$ 50.00
Contingency				$ 333.34		$ 193.69
			Cost:	**$ 2,000.04**		**$ 1,162.13**
COMMERCIAL SYSTEMS AVAILABLE:						
Traditional Vending Machine Costs:						
40 selection machine				$ 5,817.50		$ 4,475.00
Coke Conveyer				$ 5,125.00		$ 3,660.71
Bar Gun Base EcoStream System (just add controls)						
5 selection bar gun system				$ 1,710.00		$ 1,221.43
8 selection bar gun system				$ 2,276.00		$ 1,625.71
12 selection bar gun system				$ 3,418.00		$ 2,441.43

Appendix H – Project Timeline

	Milestone	Status
Yr 1	Tong and Schoof Competition	Completed
	Talk with Warf	Completed
	Build Second Stage Prototype	Completed
	Acquire Angel Funding	In Progress
	Form an LLC	In Progress
	SAGE and Burrill Competition	In Progress
	Begin Manufacturing	To Be Completed
Yr 2	Placement in New Union South	To Be Completed
	Acquire UW Contract	To Be Completed
Yr 3	Develop Brand	To Be Completed
	Seek Merger and Acquisition	To Be Completed