

BREVARD COUNTY

ABSTRACT

Brevard County (School Food Services) is the first district to attempt a completely closed loop polystyrene recycling program. This is the only fully operational system of its kind which qualifies it as technologically advanced. While there are other counties in the state working with polystyrene, a nontraditional material, their attempts at recycling have resulted in warehouses and storerooms full of bundled foam refuse with no outlet to dispose of the material other than the landfill. Although more cost effective than paper, many districts have not made the switch to polystyrene. As a result, huge amounts of paper products flow through the solid waste stream and into local landfills.

Polystyrene recycling is technologically transferable, in that it is not restricted by region. Indeed, the only requirement is the use of polystyrene, whether it be in a school lunch program, fast food operation, correctional facility or employee cafeteria. It may be more cost effective for larger districts; however, smaller districts could receive the same cost benefits by collaborating in joint efforts. In this way, smaller districts could purchase their polystyrene in a more competitive environment due to higher volumes. The opportunities to educate school business officials and food service administrators to the benefits and processes of polystyrene recycling are easily obtainable through the attendance and participation in annual professional seminars and conferences.

Cost effectiveness can be measured through monetary savings in a number of areas. In districts switching from paper products, this savings will pay for the entire program. This is also the case in programs that elect to eliminate dish machines. Pilot schools indicate a decrease in the volume of refuse going into the solid waste stream and landfills, thereby reducing the collection fees at each site. Theoretically, this will lead to a decrease in the solid waste assessment fee paid by the district.

The benefits of this recycling program are quite simple: implementation of a closed loop system, with nothing ending up in the landfill. In addition, the company is willing to share in the profits of products that can be manufactured from recycled polystyrene. The benefits to the environment are twofold: polystyrene refuse is eliminated from the solid waste stream and, for those districts switching from paper products to polystyrene, the destruction of harvested trees is no longer necessary. In addition, students can participate in a recycling program that will ultimately make Florida a better place to live for them and the generations to follow.

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PROJECT DESCRIPTION

The following is a detailed description of the polystyrene recycling project currently being piloted in Brevard County Schools. The intent of this description is to provide poignant and relative information supporting the feasibility of such a recycling project within the district. This is an individual county project. This proposal is written by Brevard County Solid Waste Management and Brevard County School Food Service and is to be used by Brevard County Public Schools.

HISTORY: Expanded polystyrene (EPS) is currently used by Brevard School Food Service as the primary source of papergoods used to serve student participants in the reimbursable National School Lunch Program (NSLP). Polystyrene, or foam, is superior to the paper products previously used in the lunch program for a number of reasons. These reasons include, but are not limited to: increased durability, greater capacity to maintain appropriate food temperatures, lighter weight, more liquid resistant (less messy), less expensive, and recyclable. However, if it is not recycled, polystyrene takes up a huge amount of space in the landfill. Researchers estimate that one pound of polystyrene requires one cubic foot of landfill space. This number will fluctuate depending on the manner in which the polystyrene is handled at individual landfills.

Brevard County serves approximately 5,500 breakfasts and 30,000 lunches each day. If we assume that each student takes one tray and one spork (a combination spoon and fork), we are contributing 35,500 pieces of polystyrene to the local landfill each school day. Multiply that by 180 school days and we contribute 6,390,000 pieces annually and ~~this~~ does not take into consideration a la carte sales, adult participants, or the bowls, cups and platters used each day!

The proposed recycling project is a completely closed loop system, in that absolutely nothing ends up in the landfill. This recycling project removes the polystyrene, identified earlier, from the solid waste stream by routing it from the school site directly to the recycling plant in Lakeland, Florida. This is the most logistically feasible program that has been researched to date.

In a further effort to address environmental concerns, Brevard School Food Services uses a lunch tray containing 25% post consumer recycled material. The SY19998 papergoods bid requires managers to order only polystyrene products that can be processed through this recycling program. In this way, the Food Service Department has already made a commitment to the improvement of the environment, at the same time providing a high quality of food delivery to the students.

PROJECT DESCRIPTION: School Food Services purchases polystyrene foam products that are used to serve student meals. In the school where the program is being tested, the students dump any leftover food from their trays into the trash dispensers in the cafeteria. Polystyrene products are either placed directly into a recycling densifier, or neatly stacked for later disposal into the machine.

The recycling machine is a self-contained piece of equipment that is approximately the size of a small refrigerator. The machine is provided by Central Florida PolyRecyclers and Plastic Recovery Solutions, Inc. (Both companies have been in operation approximately nine years.) The machines will be owned by Brevard County School Food Services. The maintenance, pickup, and haulage fees will be allocated from the Food Services budget. The machine houses a compressor and a solution called PolySolv, which melts polystyrene on contact. When

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polystyrene is introduced into the machine, the compressor pushes the foam downward and into the PolySolv solution. The melted foam collects in the bottom of the machine where it is stored until the company, Plastics Recovery Solutions, Inc., empties the machine. This is to be done on a bi-monthly basis, or as needed.

The melted foam and PolySolv solution is pumped out of the machine and the machine is refilled with fresh PolySolv. The recycling company performs any maintenance or repair required on the machine during the bimonthly visits. The solution is trucked from the school, to the recycling plant. At the recycling plant, the liquid polystyrene is separated from the PolySolv. The PolySolv is reused, and the foam is recycled into usable materials with nothing going to the landfill.

DETAILED COSTS:

Each machine costs \$5500. We would like to receive funding to place the machines in fifty schools which would require equipment purchases of \$275,000.

Ongoing maintenance fees for pickup, refill of PolySolv, and haulage to the recycling plant requires a payment of \$140 per visit. It is estimated, based on pilot studies within the district, that the schools will require a bimonthly haulage visit, or a \$280 per month charge. Based on pilot studies, the machine holds approximately two weeks worth of polystyrene. The total for the pick-up, haulage, and recycling for fifty schools would be $\$280 \times 9 \text{ months} \times 50 \text{ schools} = \$126,000$. The Food Service Department is requesting \$25,000 to be used in the first year toward the monthly pickup fees. The department will fund the remaining pickup fees.

In addition, all administrative costs associated with the development of educational materials, supervision and staff training, and miscellaneous costs to educate the community through presentations, etc. will be absorbed by the Food Services Department as well. We estimate that administrative costs will be approximately \$3,000 annually based on 200 hours of labor. This labor includes grant writing and solicitations, community presentations, demonstrations, etc. It also includes the development of educational materials to be dispersed to students, faculty and parents. The Food Services Department has allocated funds from the annual budget to cover the ongoing costs associated with the recycling program once the initial grant money has been utilized. In addition, the department will fund the purchase of additional machines yearly as budgetary constraints permit.

School Foods Services spends approximately \$327,806 annually on the purchase of polystyrene products used by students each day. This number is based upon the purchase of trays and sporks ONLY and is calculated based on the number of reimbursable meals, 35,500 daily, and number of serving days (180). This figure is a conservative estimate as it does not include a la carte meals, adult meals, or any bowls, cups, etc. that may be used. This estimate was calculated as follows:

25% Post Consumer Trays:	$\$34.78/1000 \times 35.5 \times 180 \text{ days} = \$222,244$
Sporks:	$\$16.52/1000 \times 35.5 \times 180 \text{ days} = \$105,562$
Total Cost to Food Services:	\$327,806

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COST BREAKDOWN:

Total one time cost to purchase fifty recycling machines:	\$275,000
Administrative cost for project development (education):	3,000*
Maintenance, pickup, haulage fees:	101,000*
Grant request for first semester haulage fees:	25,000
Total Cost for Recycling:	404,000
Total Cost for Brevard School Food Service:	<u>104,000</u>
Total Grant Request:	\$300,000

*Indicates public sector money (School Food Services) to satisfy the grant.

TIMELINE: Immediately upon notification of acceptance and completion of necessary paperwork, Brevard School Food Service will implement the delivery of the funded recycling machines into fifty school sites. It is desirable for the machines to be in place before the last day of school, May 21, 1998, in order to allow students to become familiar with the program prior to the beginning of fall term. However, Plastics Recovery Solutions, Inc. can manufacture only three machines per week. Therefore, installation of the machines will be guaranteed prior to the beginning of the fall term. The summer months will be used for manager training, and development of educational materials to be used in conjunction with the recycling project. Beyond recycling, it is the intent of the school district to educate students and families to the benefits of recycling.

The fall term would be used to officially implement the recycling program. Close monitoring would be used to determine the decreased volume of refuse generated and placed in the school dumpster. This evaluation would be used to determine if the school could reduce the size of their dumpster, or reduce the number of times the dumpster is emptied. By decreasing either factor, the solid waste assessment fee paid by the district would be reduced, as well as, the collection fees paid to the haulers. This information will also be used as justification to continue the recycling efforts.

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ADVANCED TECHNOLOGIES OR PROCESSES

Brevard County is the first school district to attempt a completely closed loop polystyrene recycling program. While, there are several counties in the state that are recycling paper, aluminum, cardboard, and glass, we are not aware of any other district that is successfully recycling polystyrene. In fact, many districts are using paper, even though it is more than double the cost, for their lunch programs. Dade county is currently investigating the possibility of switching from paper products to polystyrene. By making this switch, greater quantities of polystyrene will be available to recycle and Dade County will save over 2.1 million dollars a year. Brevard County has already made this switch. Unfortunately, our trays are going straight to the landfill and this accounts for greater than 71,000 products per day, assuming one tray and one spork per reimbursable lunch. This does not include additional bowls, cups, trays, etc. that are being used.

We assume that any county that switches from paper to polystyrene will provide potential increases in recoverable polystyrene for recycling. We further assume that the greater the supply, the more recycling will take place. Brevard County currently uses only 25% post consumer recycled lunch trays. By using a tray that requires 25% post consumer polystyrene material, we are creating a demand for post consumer polystyrene. Because recycled polystyrene can be used to make other high density materials, we assume that increasing the supply will make the manufacture of these materials more feasible and in turn create a market for their use. Some examples of school supplies that are currently manufactured from post consumer polystyrene include: rulers, office equipment, and materials for the school lunch program.

Ultimately, in order to make this a truly closed loop system, our goal is to one day use a lunch tray that was recycled through our program. That means that the tray you eat from tomorrow, may have been made from a tray you ate on last month.

With an increased supply of recyclable materials generated through our polystyrene recycling efforts, and an increased demand for their use, polystyrene recyclers currently located in Lakeland have voiced an interest in relocating their plant to the central Brevard area. This relocation would provide job opportunities for local citizens already impacted by the 600 layoffs at NASA. This is a dual benefit as NASA is also looking into this recycling system for their polystyrene refuse. In addition, it would decrease the costs associated with the pickup and haulage of the liquid polystyrene currently being transported to Lakeland to be recycled.

This project is an innovative recycling program with tremendous potential for Brevard County and the State of Florida. At present, this system is not operating in any school district in America. Duval, Orange, and Pasco counties do have "recycling" systems in place, however, due to the closure of the MPRC facility that served the Eastern United States, they are not actually recycling polystyrene.

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TECHNOLOGY TRANSFER

Innovative recycling of polystyrene is NOT restricted by region. School food service operators throughout the United States could benefit from this project. Every school district must provide meals to children. In doing so, the meals must be provided using some type of serving medium. Polystyrene is the product of choice because of the low cost, convenience, durability, thermal capability, environmental friendliness, and recyclability. Districts currently using polystyrene make a natural fit with recyclers because they already have materials needing recycling. Because the polystyrene is collected, melted on premise, and retrieved at the school, there are no facilities constraints or logistical problems in storage and transport of used polystyrene. Once a machine is provided to a school, they are ready to start the program immediately.

Specific transferable activities of the project include: purchase or rental of recycling machines, collection of polystyrene by students, deposit of polystyrene into the recycling machine; and pick-up, maintenance, and haulage by the recycling company to the recycling plant.

School districts that do not currently use polystyrene would require minimal education as to the benefits of switching from paper to foam. This could be accomplished through public presentation at various levels, both food service oriented and those requested by DEP. The administrative staff of Brevard County School Food Service regularly attends seminars and conferences that provide the perfect platform for this education. It would be quite easy to present educational seminars related to the benefits of polystyrene use in conjunction with recycling. These conferences/seminars are attended by Florida school officials and food service administrators at large. Conferences regularly attended by Brevard County Food Service Administrators include: Florida School Food Service Association (FSFSA), Florida Association of School Business Officials (FASBO), and FSFSA Region IV Conference.

Brevard County Food Service Administrators are willing to commit to public presentations as necessary to facilitate the transferability of this recycling program. In addition, the current administration actively presents demonstrations and informative discussion as needed in an effort to raise funds for the district project. It is realistic to assume that one presentation per annual meeting could be accomplished the first year of the project, with follow-up in future years. Once the system is in place, directors from other districts could visit at any time, throughout the school year, to observe the program in operation.

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COST EFFECTIVENESS

In summary, costs include the purchase or rental of recycling machines and the ongoing maintenance of the program. Benefits include: cost savings generated by using polystyrene instead of paper in the cafeteria; decreased labor and dish machine operation costs; a completely closed-loop recycling system with nothing going into the landfill; higher quality food delivery to students; possible relocation of polyrecyclers from the Lakeland area to the Melbourne area; and decreased solid waste collection and assessment fees paid by the district.

Currently, there are no other programs like this one in operation in the state. Brevard County has developed an estimate of cost/benefit based upon savings generated by switching from paper to polystyrene, as well as, numbers generated in pilot tests within the district that show a significant decrease in the volume of trash generated with this program. We have used these numbers to determine the impact the program would have on current waste management fees and cost of recycling fees incurred by the district. We estimate that the savings generated by those districts currently using paper products who switch to polystyrene in the lunchrooms, would in essence pay for the implementation of polystyrene recycling in their districts.

Brevard County made the switch from paper to polystyrene over ten years ago. This switch came about for two reasons: 1) foam was less expensive, and 2) foam is superior to paper in food service for reasons previously mentioned. In 1996 Brevard County switched to a lunch tray containing 25% post-consumer recycled polystyrene material. With the onset of SY1998, the Food Services Department made a commitment to use 100% polystyrene materials for the food program. The current paper goods bid reflects the addition of these products. Because we have already made this switch, we have already experienced the savings. Our district has set aside additional monies in the annual food services budget to fund the pickup, haulage, and recycling of polystyrene in fifty of our schools when this project reaches fruition.

Using the cost savings estimate that would be generated by Dade County switching to polystyrene from paper, we show that the money saved in switching to polystyrene, over 2.1 million, could easily be used to offset the cost of implementing the recycling program. The study in Dade County was conducted by South Florida PolyRecyclers, Inc. and the original study is available for review.

By reducing the amount of trash going into the dumpster, individual schools will be able to either downsize their dumpster, or decrease the number of times their dumpsters are emptied. This will not only positively impact the school's collection fees, it will decrease the district's annual solid waste assessment fee, \$313,264 in SY1997, which is based strictly on the size of the dumpster and number of times it is emptied. This is a significant portion of the total solid waste management fee paid by the district in 1997 which totaled \$842,968.85.

Individual schools paid approximately \$6926.42 for garbage collection in SY1997, an average increase of \$500 per school from the previous school year. (Average yearly increase for garbage collection fees over the past five years is \$352.80 per school) Total waste management fees paid, including recycling, solid waste, recycling assessment, and garbage collection, totaled approximately \$11,708.29 per school during SY1997. Based on a similar pilot recycling

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program, we estimate that removing polystyrene from the dumpsters will result in an overall reduction of trash volume of approximately 30%. We averaged a 30% reduction in volume at the elementary level and a 50% overall reduction in trash volume at the secondary level. However, when the original pilot was underway, the district was only using polystyrene ~~trays~~. We are now using trays, bowls, cups, sporks, etc. We assume, based on the reduction in overall trash volume from similar pilot programs, that we can reduce the collection fees by approximately ~~one~~ third.

We assume that a districtwide recycling effort, with machines in place at each school, would result in greater than 95% recovery of foam lunch materials. These recycled AND recyclable materials would be marketed to area ~~poly~~recyclers currently using these scrap materials to manufacture rulers and various office equipment. This will create a demand for more post consumer material and increase the value of the polystyrene recovered in the recycling program. This should lower the cost of the monthly pickup fee because the postconsumer material is worth more.

As the supply grows, we assume the manufacture of other lunch room materials, such as sporks would be available. The continued availability of postconsumer eating utensils and trays, completes the recycling loop for food service departments. We hope to eventually specify only polystyrene products containing postconsumer material.

(The above calculations do not reflect the savings relative to the elimination of labor and maintenance of dish machine operations still currently in place in those districts continuing to use plastic washable trays.)

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NONTRADITIONAL MATERIALS

Expanded polystyrene (EPS) is a foam material used in many food service industries today. By definition, polystyrene is a nontraditional item that is part of the solid waste stream. Many people recognize this product as 'popcorn' in package shipping, as egg cartons, or the foam that is under most meat items at the grocery store. Brevard County School Food Services uses polystyrene in the National School Lunch Program which contributes approximately 71,000 pieces of polystyrene to local landfills daily. Currently, these polystyrene products constitute part of our local solid waste stream.

Unlike the recycling efforts of other districts, our program proposes a completely closed loop recycling system with nothing ending up in the landfill. In addition, the pickup, haulage and maintenance of the project is nontraditional in that we were unable to locate any other district currently using this program. The recycling project begins with the purchase, by food service, of 25% post consumer polystyrene trays for students to utilize during meal time. Students eat off of these materials and then dispose of their food leftovers in a cafeteria garbage dispenser. The polystyrene trays, cups, sporks, bowls, etc. are placed into the recycling machine. The machine houses a compactor that pushes the foam downward and into a solution of PolySolv. The solution melts the foam on contact and turns it into a liquid. The liquid remains in the machine and is pumped out bi-monthly, or as needed, by the company supplying the machine, in our case this would be Plastics Recovery Solutions, Inc., a division of Florida PolyRecyclers. The poly-recycling company refills the solution and hauls the melted foam to their recycling plant in Lakeland, FL. At the recycling plant, the foam is reconstituted into other usable polystyrene products. Nothing ends up in the landfill except food items discarded from trays.

End products specific to school use include rulers, desk top organizers, and eventually sporks and lunch trays. Demand for such products fluctuates, however, Florida is one of the fastest growing states in America and with growth there is continuous building of schools and a continuing need for school supplies, and lunch room materials. In Brevard County, we are currently working on the construction of three new schools to open in SY1999.

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REGIONAL PROGRAMS

This is an individual county proposal that does not demonstrate or implement a multi-county regional recycling program. However, it does possess the ability to be implemented in any district using polystyrene food service products. Great detail is given this topic in the section "Technology Transfer" of this proposal.

Because all of the melted polystyrene is hauled to Lakeland from Melbourne, the materials do travel through a multi-county jurisdiction. This does open the window of opportunity for neighboring counties to begin recycling efforts.

In an attempt to include other districts in the recycling program, and as a tool to educate neighboring Food Service Directors, Brevard County hosted a polystyrene recycling demonstration and presentation on February 5, 1998. Invitations were sent to all district Food Service Directors and members of the Florida School Food Service Association (FSFSA) in order to solicit information and provide panel discussion regarding the transferability of this project to area districts. Coverage of the program appeared on Channel 2 News.