

## Executive Summary

For the purposes of this report, we focused on the K-12 educational sector, the higher education sector, and book publishers. Our research project was designed to review the lifecycle of textbooks from production through disposal, and identify decision points that the general public must make, as well as recommendations for recycling of books at their end of useful life.

This report is based primarily on what currently happens to textbooks at the end of their useful life. While many schools and higher education students' dispose of books through selling them or donating them to any number of third parties, the book still is being used, and therefore is not part of our study. There is some reference to book donation programs in the case studies, however, where this practice occurred. We focused instead on those books that are either damaged, unwanted, or have no other useful purposes that are currently being sent to landfills. This "waste" is what we focused our research and evaluation on, with an intended outcome consisting of a set of recommendations that students and schools could adopt and implement.

Our original assumption was that recycling books would be relatively easy, but our research indicates that it requires discipline, structure, organization, an outlet and method for disposal and processing of books, and a change in behavior when it comes to educating the public about the recyclability of books. Some municipalities will accept books in their waste stream; others will not. Some recyclers will de-case the book (remove the cover and binding); others grind or shred the entire book. The positive news is that when books are recycled, the recovered fiber is being put to good re-use – generally in tissue, cardboard, linerboard, boxboard, or insulation, thereby saving virgin resources. The bad news is that not enough books are currently being recycled; however, this is a situation that can be changed – given enough incentive, education, and implementation of proven methods of disposal and processing.

The intent of this report is to highlight the lifecycle of textbooks, from production through disposal, and to provide needed information and recommendations to various interested sectors on how they might establish a textbook recycling program at their school, university, or in their community.

*Books to the ceiling,*

*Books to the sky,*

*My pile of books is a mile  
high.*

*How I love them! How I need  
them!*

*I'll have a long beard by the  
time I read them.*

*- Arnold Lobel*



**After all, an unusable or unwanted book is a  
terrible thing to waste.**

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## Intended Audiences for this Report

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### Educational Institutions

With over 150,000 K-12 public, private, charter, and magnet schools in the U.S., there is a significant market for educational textbooks. Our research indicates that K-12 schools want to recycle textbooks, but generally do not have enough information on how to institute a textbook recycling program.

There are also over 4,100 higher education institutions in the U.S. today, a combination of 2-year and 4-year colleges and universities. While many have paper recycling programs, textbooks are generally not included in their recycling mix.

It should be noted that most educational institutions contract with different and multiple waste vendors which contributes to a lack of consistent methods for collection.

### Publishers

There are currently 33 textbook publishers in the U.S., and 310 "General Education" publishers. Combined, they produce over 4.3 billion books annually, and are also responsible for disposing of obsolete book inventories over which they have control.



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## Books in the Landfill - An Avoidable Waste

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The U.S. Environmental Protection Agency (EPA) produces a biannual in-depth report of materials in the solid waste stream, titled "*Municipal Solid Waste in the United States, 2009 Facts and Figures*." Books fall into the "Paper and Paperboard Non-durable Goods" category, and the 2009 EPA report indicates that while 33.3 percent of books in the waste stream are recovered, approximately **640,000 tons** are discarded into the landfill.<sup>12</sup> Books comprise roughly 0.4 percent of total municipal solid waste generation.



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<sup>1</sup> U.S. EPA, *Municipal Solid Waste in the United States, 2009 Facts and Figures*, p.78.

<sup>2</sup> It should be noted that during our peer review, several questions arose about the reliability of the EPA MSW Characterization Report regarding whether or not EPA's numbers were based on the total number of books sold versus sampling landfills to statistically determine the percentage. However, we are not aware of other waste characterizations that include books so this could not be verified.

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## Lack of Consistent Methods for Collection

While some educational institutions may have recycling programs, they tend to focus on materials that are most commonly recycled, such as copy paper, aluminum and steel cans, plastics, and glass. Schools, both K-12 and higher education, tend to follow the same recycling processes and systems already in place by municipalities. Single-stream recycling is being adopted by an increasing number of American communities with mandates to increase diversion rates, lower local governmental costs and/or increase recycling program efficiencies. Curbside collection programs commonly require residents to do at least some sorting of the recyclable materials put at the curb. In recent years, however, there has been a trend toward single-stream curbside collections programs, in which no sorting is required of the residents. The American Forest & Paper Association (AF&PA) estimated that 50 percent of curbside recyclables collection programs were single-stream in 2007.<sup>3</sup>

### Single-Stream Recycling:

Refers to a system in which all paper fibers, plastics, metals, and other containers are mixed in a collection truck, instead of being sorted into separate commodities. In single-stream, both the collection and processing systems are designed to handle this fully commingled mixture of recyclables, with materials being separated for use at a materials recovery facility (MRF).

These programs require that the materials be taken to a Materials Recovery Facility (MRF) for processing. Although EPA does not provide exact numbers of municipalities that participate in single-stream recycling, the number is expected to be higher than 50 percent at this time. Correspondingly, the number of MRFs has also grown from 70 in 2001 to over 160 in 2009.<sup>4</sup>

## Survey Data on Recycling at Educational Institutions

As part of our research, we conducted several surveys of both K-12 and higher education institutions on recycling practices, with a specific emphasis on textbook recycling. These surveys were sent to schools in Minnesota and Wisconsin because of our plan to implement pilot projects in those two states due to their close proximity to the NewPage deinking facility in Duluth, Minnesota. Although we requested survey responses from over 570 K-12 schools in Minnesota and Wisconsin, only 27 responded to the survey. ***Because the survey response was so low, we did not feel we could extrapolate the data; therefore, we have treated it as anecdotal rather than statistical certainty.*** The majority (89 percent) of K-12 survey questions were answered in full by a school administrator. There was a good balance of elementary, middle, and high school respondents, fairly evenly split between public and private schools. Of these, more than 60 percent of the schools recycle, and the decision to do so is predominantly decided upon at the individual school level.

### K-12 SURVEY RESPONSES

K-12 survey respondents indicated the following:

- More than 57 percent participate in book donation or “give away” programs for obsolete textbooks.
- Approximately 37 percent of respondents said that they store obsolete or damaged books at the school because they are unsure what to do with them from a disposal standpoint.
- In terms of the volumes (numbers of books) that a school recycles annually for both hard cover/casebound textbooks and soft-cover workbooks, the quantities vary from 100 books (54 percent) to over 500 books (14 percent).

<sup>3</sup> American Forest & Paper Association, 2007 Community Survey Executive Summary

<sup>4</sup> Columbia University, Earth Engineering Center, *Comparison of Green House Gas Impacts of Dual-Stream vs. Single-Stream Collection and Processing of Recyclables, A Study for Waste Management.*

- Reasons why schools no longer use a specific textbook also vary – usually it is because a textbook has been replaced by a newer edition (93 percent), has become obsolete (90 percent), has been damaged beyond repair (78 percent), or has been replaced by a different textbook through adoption (70 percent).
- Over 50 percent of respondents felt that textbooks and workbooks are under-recovered for recycling.
- A majority (80 percent) of K-12 respondents indicated that June would be the optimum time to host a textbook recycling event.

### HIGHER EDUCATION SURVEY RESPONSES

We had much greater success with survey responses from higher education institutions. Online survey requests were sent to 2,000 higher education campuses, and we received 374 responses from 149 schools in 37 states as well as Puerto Rico and British Columbia. Respondents were a combination of students, faculty, and staff. The majority of responses came from private schools, followed closely by public schools and also included tribal colleges, Historically Black Colleges and Universities (HBCU's), Hispanic Serving Institutions (HSI's), and Land Grant Universities (LGU's).

Higher education survey respondents indicated that:

- In terms of whether or not the campus currently recycles textbooks, over 36 percent responded that they did recycle both hardbound and softbound textbooks.
- 4 percent of respondents said that they only recycled soft-cover books.
- 26 percent said that they did not recycle either type of textbook.
- 33 percent of respondents were unsure whether or not the campus recycled textbooks of either type at all.
- An overwhelming number of respondents indicated an overall interest in book recycling.
- When asked what time of year would be the best time to host such an event, 93 percent of higher education institutions said that in late spring after final exams would be the optimum time, and 55 percent said that after the winter finals would be the second preferred date.

### Projected Impact of Textbook Recycling Projects

As stated previously, an estimated 640,000 tons of books are sent to the landfill annually. At an assumed average weight of 4 pounds each<sup>5</sup> that equates to approximately 320 million books that are discarded each year and not being recycled. With even a modest 10 percent increase in book recycling, we can avoid landfilling 32 million books annually, and put the fiber to good re-use.

There are approximately 150,000 K-12 school. Even if an additional 5 percent of these schools recycled textbooks, there would be a significant reduction in the number of textbooks going to landfills annually.

However, to get a sense of how practical it is to actually recycle textbooks, there needs to be an adequate understanding of the educational publishing sector, the volumes of books produced, the manufacturing requirements and standards, as well as the parties that are involved in the production and disposal processes.



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<sup>5</sup> Note that textbooks can weigh between 2 to 10 pounds each, but that many paperbacks, children's books, and other mass market books can weigh significantly less. For illustration purposes, we used the 4 pound average. In any case, too many books of all weights and formats are being landfilled instead of recycled.

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