

Achieving the Book Industry Environmental Council Climate Goal

Executive Summary

This will examine how the book industry may achieve an industry wide greenhouse gas reduction of 20% below a 2006 baseline by 2020. Two primary paths are outlined: one in which the emissions reductions are achieved entirely by increasing the average recycled content of book papers, and the other where a variety of actions combine to achieve the targeted greenhouse gas reduction. Assuming that forest carbon loss is accounted for, the book industry could achieve a 20% emissions reduction by increasing the average recycled content (including pre and postconsumer fiber) of books to just over 40%. If the industry increase recycled content to 30% that would achieve a reduction in greenhouse gas emissions of 14.2%. The remaining 5.8% can be achieved by combining any 3 of the 6 options listed below:

- Reduce average basis weight by 3.5%
- Reduce the average return rate from 25% to 22%
- Increase the energy efficiency of mills, printers, publishers, retailers and distribution by 4.5% each
- Reduce the portion of books that are landfilled by 25%
- Increase recycled content an additional 3.5% (above 30%) to 33.5%
- Publishers, printers, mills, and retailers each use 5.5% next generation renewable energy

Companies in the book industry have demonstrated that progress towards each of the six options above is possible. Many publishers have reduced average basis weight in recent years and Scholastic includes language about evaluating basis weights in its environmental policy. Through its Green Partners Program, Chelsea Green has reduced its return rate to just over 16%. A number of large publisher have set targets to use an average of 30% recycled fiber, and Random House and Thomson Shore and others have implemented energy saving upgrades while New World Library and Cascades are producing energy from renewable sources onsite. Details of these examples are discussed in more detail throughout the report.

If forest carbon loss is not included the total impact of the book industry is considerably less (8.8 million tons compared to 13.9 million tons) though it may ironically be more difficult to achieve a 20% emissions reduction because the benefits of recycled paper are considerably lower in such a scenario. Pathways to achieve a 20% reduction when forest carbon loss is not included are detailed in section 2 of this report. Reducing the industry's emissions by 20% will be a significant accomplishment and will have the effect of preventing the release 2.78 million tons (more than 5.5 billion pounds) of carbon dioxide. However, as is demonstrated in more detail variety of very achievable accomplishments can make this goal a reality.

Introduction

In April 2009, the Book Industry Environmental Council established a goal of reducing the book industry's total greenhouse gas emissions to 20% below 2006 levels by 2020 with a long term target of an 80% reduction by 2050. Since many of the factors that affect the book industry's carbon footprint are rapidly evolving, it would be extremely difficult and highly speculative to propose potential paths to achieve the long term 2050 target. As such, this report will focus exclusively on the 2020 target of a 20% reduction below the 2006 baseline. This report will demonstrate a variety of ways the book industry could achieve this goal under two scenarios. The first section of this report will describe accomplishments that would help lead to a 20% reduction in greenhouse gas emissions (i.e. increase energy efficiency by 3.5%), the second portion will provide suggestions and case studies that will illustrate how to achieve these gains (i.e. switch from T-12 to T-8 fluorescent lighting).

Ever since the BIEC began discussing climate issues, there has been spirited debate about whether emissions associated with forest carbon loss should be included in the industry's carbon footprint. This debate has not yet been resolved but this report will initially demonstrate how the BIEC climate may be achieved if forest carbon loss is included since that is how the initial industry carbon footprint was calculated by Green Press Initiative and the Book Industry Study Group in 2008. A summary of the debate over forest carbon loss and additional options to achieve the BIEC climate goals if forest carbon loss is not included can be found in the third section of the report.

Regardless of how forest carbon is accounted, it is quite likely that increasing the amount of recycled fiber in book papers will result in a significant portion of the reduction necessary to meet the 20% greenhouse gas reduction target. Many publishers have set goals to use at least 30% recycled paper by 2012 or endorsed the *Book Industry Treatise on Environmentally Responsible Publishing* which sets a similar goal for the industry. Given these targets, this report will assume that the industry will use an average of at least 30% recycled fiber for book papers by 2020.

This report will present two options to obtain a 20% industry wide reduction in greenhouse gas emissions. Option A will describe how the goal could be achieved by only increasing the amount of recycled content while leaving all other variables the same. Option B will demonstrate a "wedge" approach to reducing impacts (adapted from Princeton professors Rob Socolow and Stephen Pacala's wedge approach to climate change. For more information see <http://www.wri.org/stories/2006/12/wedge-approach-climate-change>). Under the wedge approach a large portion of the required emissions reduction is achieved through using at least 30% recycled fiber. The remaining reduction is divided into three wedges. Six choices that could represent those wedges will be presented, any three of which would combine to further reduce emissions below the goal for 2020. The table below summarizes the industry's carbon footprint and the reduction required to achieve the 2020 goal.

Book Industry Carbon Footprint and Targeted Reduction (when forest carbon is included)	
Book industry carbon footprint:	13.90 million short tons (12.61 million metric tons)
Required reduction from baseline to achieve 20% reduction target:	2.78 million short tons (2.52 million metric tons)

Section 1: Achieving the BIEC Climate Goal

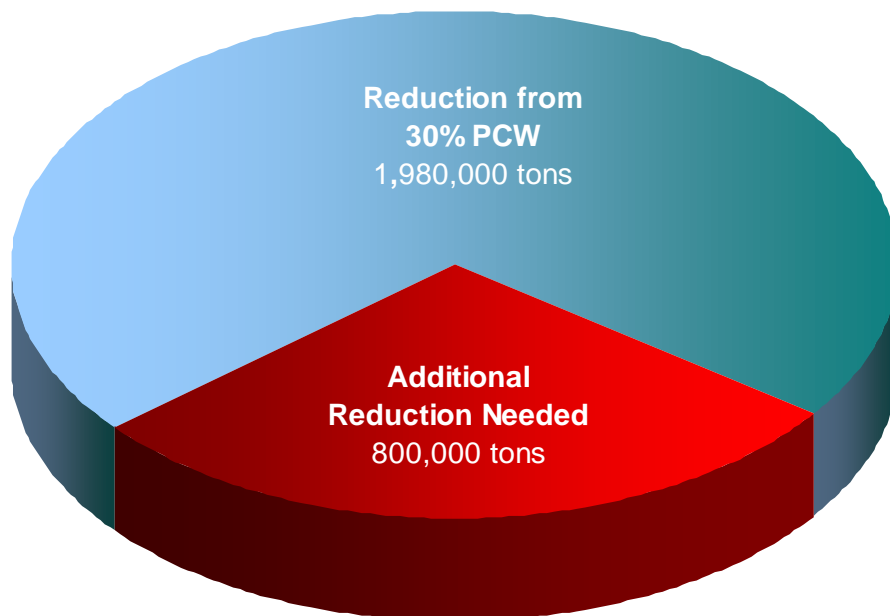
Option A-Industry Uses 40.1% Recycled Fiber

Reduction = 2.78 million tons, 20%

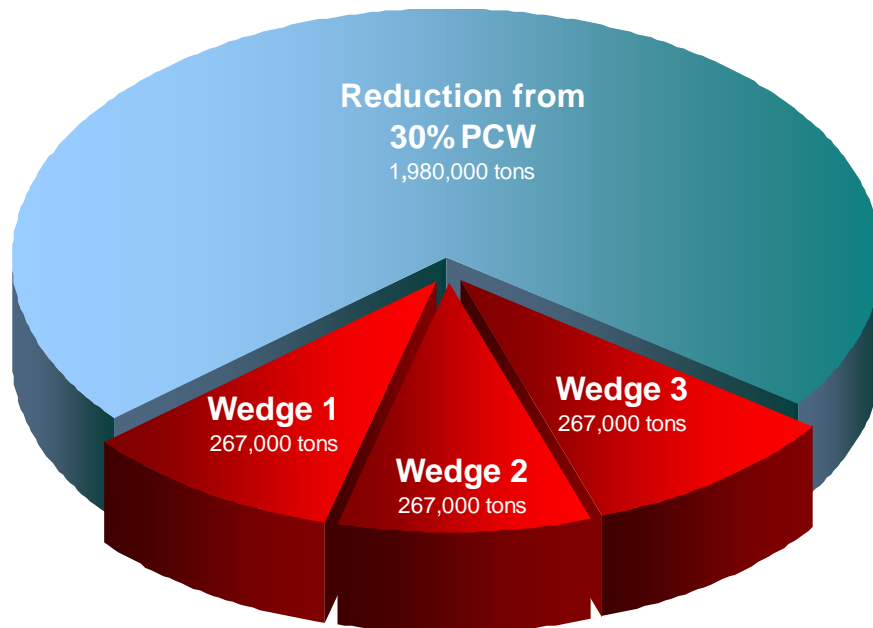
At current levels of production, it would be possible to achieve a 20% reduction by increasing the industry's use of recycled fiber to 40.1% for all paper grades. Given the broad support for a 30% recycled fiber target by 2012, it seems likely that achieving just over an additional 10% in 8 years would be possible.

Option B- 30% Recycled with 3 wedges

Under this option, the majority of the emissions are again reduced by achieving an industry average of 30% fiber for all paper grades. As shown below, achieving an average of 30% recycled fiber will reduce emissions by 1.98 million tons or over 70% of what is necessary to reach a 20% emissions reduction. This leaves about 800,000 tons that will need to be reduced through other means.



This additional reduction of 800,000 tons can be divided into 3 wedges of about 267,000 tons each.









There are many different ways that the book industry may reduce emissions by 267,000 tons. A list of some of these potential wedges is below. All of these wedges would result in an emissions reduction of slightly over 267,000 tons. Any three of these wedges would combine with the reductions from using 30% recycled fiber to achieve a 20% reduction in emissions. In reality, each wedge needs to be slightly larger than 267,000 tons because many actions to reduce the climate impacts of the book industry will interact with each other. For example, a reduction in the return rate will have a lower benefit if there is also a reduction in basis weight because less paper will be used in the returned books than would have been otherwise. Likewise, a reduction in basis weight will have a lower benefit if there is a higher level of recycled content because while you are reducing the amount of paper used, the impact of that paper is not as great. Any three wedges detailed below, combined with the use of 30% recycled paper will result in a total reduction in emissions of at least 20% below 2006 levels.

Reduction for using 30% recycled fiber

Reduction = 1.98 million tons, 14.2%

Potential Wedges for Option B*

*Note: The reductions below are from the described change at 30% recycled content in isolation of other changes. Many of the wedges will interact with each other causing the total reduction from any three options to be slightly smaller than the sum of the reductions listed below.

Wedge	Emissions Reduction
 Reduce average basis weight by 3.5%	316,189 tons (2.27%)
 Reduce return rate from 25% to 22%	288,205 tons (2.07%)
 Increase the efficiency of mills, printers, publishers, retailers and distribution by 4.5% each	283,688 tons (2.04%)
 Reduce the portion of books that are landfilled by 25%	282,572 tons (2.03%)
 Increase recycled content an additional 3.5% (above 30%) to 33.5%	277,098 tons (1.99%)
 Publishers, printers, mills, and retailers each use 5.5% next generation renewable energy	272,534 tons (1.96%)

Combined reduction for 30% recycled content plus three largest wedges (Reduce average basis weight by 3.5%; reduce return rate from 25% to 22%; and increase the efficiency of mills, printers, publishers, retailers and distribution by 4.5% each)

Reduction = 2,856,122 tons, 20.5%

Combined reduction for 30% recycled content plus three smallest wedges (Publishers, printers, mills, Increase recycled content an additional 3.5% (above 30%) to 33.5% and retailers each use 5.5% next generation renewable energy and Reduce the portion of books that are landfilled by 25%)

Reduction = 2,811,469 tons, 20.2%

Section 2: Ways to Reduce Book Industry Green House Gas Emission

Reducing Returns

It is currently estimated that on average approximately 25% of sent to retailers are returned to the publisher. This means that nearly 25% of the book industry's environmental impacts are associated with books that did not need to be produced. *Book Industry Returns: the Green Opportunity* provides a more detailed analysis of the opportunities and challenges associated with reducing the Book Industry's average return rate. Below are some suggestions for relevant sectors of the industry to help reduce the industry's return rate

Publishers

- Hold more books in a central location and provide more frequent shipments depending on sales at individual retail locations
- Print fewer initial copies and work with suppliers to ensure they can respond quickly if reprints are necessary. This may involve storing more paper on printer's floors, standardizing paper grades or printing dependable backlist titles at off peak times.
- Use POD and short/medium run printing to create just enough books to meet demand until longer-run replenishment arrives.
- Experiment with alternative sales models such as discounting books sold on a no-returns basis, or direct sales.
- Look at the big picture. If changes to the traditional model increase the cost of printing but significantly reduces returns you may still come out ahead.

Case Study:

In an effort to minimize returns and environmental impacts, Chelsea Green has established a "Green Partners Program" with booksellers. Participating booksellers receive a discount of 3% to 5% and receive free carbon neutral shipping (offsets provided by the publisher). Among other requirements, to be included in the program stores must agree to purchase books on a non-returnable basis, and have a display highlighting books about sustainable living for at least one month each year. Chelsea Green has been able to reduce their return rate to just over 16% and estimates that the program has prevented the return of almost 16,000 books.

Printers

- Collaborate with publishers to accommodate a model that involves more frequent but shorter print runs. This may include stocking larger quantities of paper on the floor.
- Keep in mind that printers that are able to successfully collaborate with publishers to limit returns will add value to their printing services.

Retailers

- Work with publishers to report sales data at individual retail locations
- Purchase fewer books initially and re-order more frequently. Large chains could store more books centrally and send smaller but more frequent shipments to each retail location
- Experiment with alternative models of purchasing books from publishers such buying books on a no-returns basis in exchange for a discount.

Reduce Average Basis Weight

Using a lighter weight paper, means using less paper, and fewer resources. From an environmental perspective using a paper that is 10% lighter is the same as using 10% less paper. Below are some suggestions for relevant sectors of the industry to help reduce the average basis weight of books

Publishers

- Evaluate each project to see if a lower weight alternative exists.
- Standardize the paper grades you use and select low weight papers for the standardized grades
- Be flexible, and shift expectations. Experiment with lighter weight papers even if they have a higher ppi.

Printers

- Stock low weight papers that are likely to meet the needs of customers

- Recommend lighter weight alternatives to customers.

Mills:

- Produce low weight papers that are likely to meet the needs of customers
- Recommend lighter weight alternatives to publishers and printers.

Increase Recycled Content

Increasing the amount of recycled fiber in books will be key to achieving the BIEC’s climate target. Each ton of recycled fiber that replaces a ton of virgin fiber will prevent over 11,000 pounds of greenhouse gases (figure based on uncoated freesheet when forest carbon loss is included). Below are some suggestions for relevant sectors of the industry to help increase recycled content.

Publishers

- Establish specific targets for increasing recycled fiber. Many publisher have established targets of about 30% recycled (with a majority PCW) by 2012
- In addition to a long term target, set incremental annual benchmarks
- Share these goals and benchmarks with suppliers so they can prepare for future demand.
- Review Green Press Initiative’s Paper and Supplier listings which includes a paper listing with dozens of grades with at least 30% recycled fiber (10% for coated grades), and a printer listing which shows printers carrying recycled grades
- Standardize the paper grades you use and select papers with high levels of PCW for the standardized grades
- Take advantage of bulk pricing by switching many titles to recycled grades at once

Case Study

In January of 2008 Scholastic announced an environmental policy which sets a target of at least 25% recycled paper (75% of which to be postconsumer) and 30% FSC certified paper by 2012. In addition, the company set a goal of evaluating the basis weight of each project, and reducing the total amount of paper that is used. Since establishing its environmental targets Scholastic has made tremendous progress towards its goals. In 2008, nearly 20% of the paper Scholastic used was FSC certified and more than 15% of fiber used was recycled (of that 15%, 83% was PCW).

Printers

- Stock a variety of papers with at least 30% recycled content
- Use a recycled grade a house sheet and make volume commitments to reduce costs
- Leverage volume commitments to offer recycled grades with no premium over equivalent virgin grades
- Recommend recycled grades to customers
- Establish goals for increasing the amount of recycled fiber you will use
- Communicate these goals to distributors, mills and merchants

[Paper manufacturers-need to add]

Case Study

Thomson-Shore was the first book manufacturer to make a public commitment to significantly increasing Their use of recycled fiber from 5.7% to 25% within a 3 year period. Within two years of making this

commitment, they had replaced over 1,500 tons of virgin fiber with postconsumer recycled fiber and exceeded their 25% goal. They established acceptable prices points, partnered with a paper mill, and committed to use a large volume of high postconsumer recycled paper as one of their default house sheets. Their commitment and willingness to commit significant volume enabled Thomson-Shore to meet their environmental goals economically—without passing any cost increases to their customers. There were minimal cost increases (~1%) that were offset by improving efficiencies at the operational level.

Increasing Energy Efficiency

Using less energy is another option to help reduce the book industry's carbon footprint. Even modest reduction in energy used for lighting, heating and cooling, office equipment and transportation of books can add up to significant savings.

All Sectors

- Replace T12 fluorescent lights with T8 or T5 fluorescent lights. This will require installing new ballasts, but can reduce the energy needs for each light by 50%.
- Replace incandescent bulbs with compact fluorescent bulbs. They use about 66% less energy, and save \$40 to \$60 per bulb over their lifetimes.
- Use task lighting to reduce the total amount of lighting used
- Adjust the thermostat to 76 °F (or above) in the summer and 65 °F (or below) in the winter
- Turn down the heat in storage areas and corridors where people don't spend much time.
- Install energy efficient windows. They can reduce heating/cooling costs (and energy consumption) by 15%.
- Ensure that the thermostat is not in a drafty area. This will allow the heating/cooling system to operate more efficiently
- Keep furniture clear of vents and radiators to allow for proper circulation
- Use EnergyStar approved appliances and heating/cooling system.
- Reducing returns (see above) will also reduce transportation emissions
- Consider relocating warehouses to reduce distances that books and paper travel

Case Study

In addition to developing a policy to use at least 30% recycled paper by 2010, Random House has taken on additional projects to combat climate change. In their offices in New York, Random House exchanged 4,000 light bulbs with more efficient bulbs, adjusted the temperature control in the building, and sourced 15% of their electricity from wind power. In January 2008, this building was awarded LEED (Leadership in Energy and Environmental Design) certification by the U.S. Green Building Council. Random House also made use of lower wattage bulbs for 1,500 bulbs in their warehouse and installed sensors and timers to turn off the lights when they are not needed.

Reduce the Portion of Books that are Landfilled

When books degrade in landfills they produce methane, a greenhouse gas that is 23 times more powerful than carbon dioxide. While reducing returns should go a long way in reducing the amount of books that are landfilled, the suggestion below will also help in reducing landfilled books, and therefore methane emissions.

Publisher

- Look to recycle or donate books that must be discarded.
- Encourage consumers to recycle, or donate books when they no longer want them
- Review suggestions for reducing returns (above)
- Consider working with retailers and/or paper manufacturers to collect and recycle old/unwanted books from consumers

Retailers

- Review suggestions for reducing returns (above)
- Consider working with publishers and/or paper manufacturers to collect and recycle old/unwanted books from consumers
- Buy and sell used books to encourage secondary market

Case Study:

A number of U.S. retailers have in-store recycling programs for some of the products they sell. For Example The Home Depot will take back and recycle expired compact fluorescent light bulbs to reduce the amount of mercury that end up in landfills.

Similarly Staples, Office Depot and many other office supply stores will take back and recycled empty printer ink cartridges (some even offer a small credit for each cartridge returned). Many of these stores also take back unwanted cell phones, PDAs and other electron devices for recycling.

Increase the Use of Next Generation Renewable Energy

Using wind, solar and other next generation renewable sources can also help reduce the industry's carbon footprint by decreasing the use of fossil fuels.

All Sectors

- Check with current utilities to see if they offer a renewable energy option
- Purchase Green-e certified Renewable Energy Credits (which offset the impacts energy generation)
- Consider generating energy onsite with windmills or rooftop solar panels

Case Study

Several companies have taken steps to source renewable electricity on site. Publisher New World Library is using solar panels on the roof of their office building to generate electricity. It is estimated that the use of solar energy reduces their electricity bill by approximately 35%, and with the available tax credits, it is expected that they will get a full return on their investment in 10 to 12 years. As New World Library's associate publisher Munro Magruder stated "Unfortunately, our business is one that depletes the earth's resources. While printing as many of our books as possible on 100% post consumer-waste recycled paper is the main way we attempt to offset that, using solar energy for our office is another effective way to help us reduce our footprint on the planet."

Another example of sourcing renewable energy on site is Cascades. Cascades has invested more than 2 million dollars in a system that captures methane coming from the decomposition of waste in a landfill, which would otherwise be burned on-site. The methane is piped 8 miles to the Cascades mill, where it is used as fuel to power the paper machines. The methane provides more than 80% of the mill's thermal power needs and is used in replacement of natural gas. As a result, Cascades has reduced their annual carbon emissions by 60,000 tons, and though Cascades has to pay for the gas to be captured and transported, the project has reduced their energy spending by 30%.

Section 3: Achieving the BIEC Climate Goal if Forest Carbon Loss Is Not Included

In a situation where forest carbon loss is not included, the pathway to achieving a 20% reduction may be somewhat different. The carbon footprint of the industry is significantly lower if forest carbon loss is not included, so the reduction necessary to meet the target is also lower. However the benefits of an industry averaging 30% recycled content are also not as great if forest carbon loss is not included. The counterintuitive result is that the industry may have to take more drastic measures to achieve a 20% reduction when forest Carbon loss is not included. The table below summarizes the book Industry's carbon footprint and required reduction to achieve the BIEC target if forest carbon loss is not included.

Book Industry Carbon Footprint and Targeted Reduction (when forest carbon is included)	
Book industry carbon footprint	8.80 million short tons (7.98 million metric tons)
Required reduction from baseline to achieve 20% reduction target:	1.76 million short tons (1.60 million metric tons)

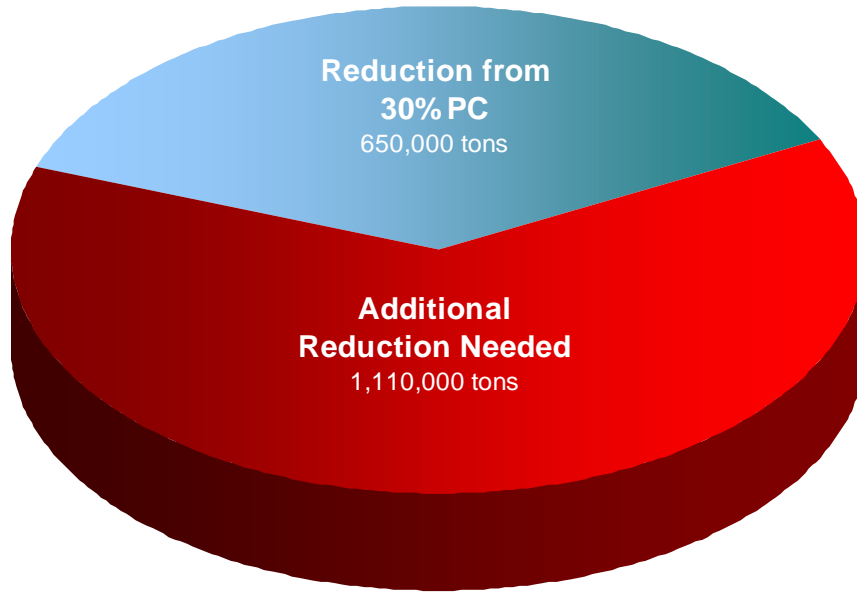
Option C- Industry Uses 73% Recycled Fiber

Reduction = 1.76 million tons, 20.0%

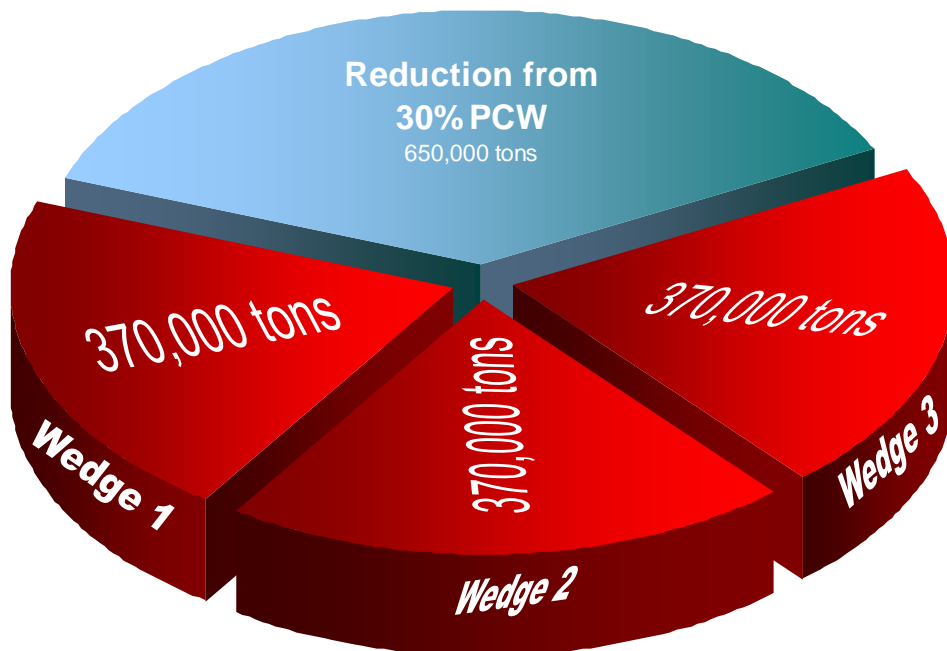
When forest carbon loss is not included, the total impact of the book industry and the quantity of emissions that must be reduced to achieve a 20% reduction is much smaller. However, since the benefits of switching from virgin paper to recycled paper are much smaller, a significantly higher portion of recycled fiber must be used if the goal is to be achieved through increasing recycled content alone. Under such a scenario, recycled content would need to be increased to an average of 73% for all paper grades. While this may not be feasible by 2020 is it useful as a comparison to option A (in section 1) which achieved a 20% reduction solely by increasing the portion of recycled fiber when forest carbon loss is included

Option D - 30% Recycled with 3 equal wedges

Under this option, less than half of the emissions reductions are achieved by using an industry average of 30% recycled fiber for all paper grades. As shown below, when forest carbon loss is not included, achieving an average of 30% recycled fiber will reduce emissions by 0.65 million tons or about 37% of what is necessary to reach a 20% reduction. This leaves 1.11 million tons that will need to be reduced through other means.



As with option 1B, this additional reduction can be divided into 3 “wedges”. In this case each wedge will represent a reduction of about 370,000 tons.



As was the case previously, there are many different ways that the book industry may reduce emissions by 370,000 tons. A list of some of these potential “wedges” is below. All of these wedges would result in an emissions reduction of slightly over 370,000 tons when forest carbon loss is not included.







As mentioned previously, the wedges can interact causing the total to be less than the sum of the reductions listed below requiring each wedge to be slightly larger than 370,000 tons. Any 3 of the wedges below would combine with the reductions from using 30% recycled fiber to achieve a 20% reduction in emissions under scenario 2.

Reduction for using 30% recycled fiber

Reduction = 0.65 million tons, 7.4%

Potential Wedges for Option D*

*Note: The reductions below are from the described change at 30% recycled content in isolation of other changes. Many of the “wedges” will interact with each other causing the total reduction from any three options to be smaller than the sum of the reductions listed below.

Wedge	Emissions Reduction
 Publishers, printers, mills, and retailers each use 5.5% next generation renewable energy	409,733 tons, (4.65%)
 Reduce return rate from 25% to 18%	408,553 tons (4.64%)
 Increase the efficiency of mills, printers, publishers, retailers and distribution by 4.5% each	395,941 tons, (4.50%)
 Reduce the portion of books that are landfilled by 35%	395,600 tons (4.50%)
 Reduce average basis weight by 7.5%	394,773 tons (4.49%)
 Increase recycled content an additional 15% (above 30%) to 45%	388,499tons (4.41%)

Combined reduction for 30% recycled content plus three largest wedges (Publishers, printers, mills, and retailers each use 5.5% next generation renewable energy; reduce return rate from 25% to 18%; reduce the portion of books that are landfilled by 33%; and increase the efficiency of mills, printers, publishers, retailers and distribution by 4.5% each). Total Reduction = 1,838,423 tons, 20.9%

Combined reduction for 30% recycled content plus three smallest wedges (Increase recycled content an additional 15% (above 30%) to 45%; reduce average basis weight by 7.5%; and reduce the portion of books that are landfilled by 35%) Total Reduction= 1,797,231 tons 20.4%

Conclusion

Accomplishing an industry-wide 20% reduction in greenhouse gas emissions will be a noteworthy achievement with tangible environmental benefits. The reduction of up to 2.78 million tons is equivalent to eliminating the emissions of about 450,000 cars each year. Furthermore the BIEC's goals of a 20% reduction by 2020 with a longer term target of an 80% reduction by 2050 are consistent with what many scientists and policymakers believe is necessary on a global scale to prevent the worst impacts of global climate change. The BIEC climate goal is one of only a few industry-wide climate goals worldwide, and demonstrable progress towards these goals may inspire other industries to set and work towards similar targets. In this way, the progress within the book industry can have a positive impact far beyond the 2.78 million tons of emissions that will be prevented in 2020. As has been demonstrated progress towards these goals can be achieved in a variety of ways. Though this report highlights two main approaches—significant increases in recycled paper and a more modest increase in recycled content combined with three wedges—in reality a much wider variety of combinations may be possible. Increasing recycled content, reducing returns, using lighter weight papers, increasing energy efficiency, using low carbon energy sources, and keeping books out of landfills, all at varying degrees present a nearly infinite number of possible pathways to achieve the BIEC climate targets. The key will be for all stakeholders in the book industry to work together to focus efforts on the options that will make the most sense from an environmental and economic perspective.