

Can Book Printing Become Carbon Neutral by 2050?

Prepared for: PubWest and IBPA

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Executive Summary

This paper includes a literature review that looks closely at the idea of carbon neutrality through the lens of four industry sectors: materials, energy, capital, and labor. Keywords and phrases are defined within the paper to highlight the terms and ideas that are a part of the industry conversation around achieving carbon neutrality. The term *carbon neutral* indicates that no fossil fuels are used to create a product, manufacturing processes do not interfere with natural systems for sequestering and storing carbon, and no other greenhouse gasses, such as methane, are released into the atmosphere as a result of production.¹ Factors regarding materials include cost and manufacturing, which are managed by paper brokers and mills. Printing presses manage the handling and distribution of materials for processing.

This paper includes information gathered from an interview with Karla Olson, the publisher of Patagonia Books, and their creative manager, Sonia Moore. Olson and Moore are environmental activists at the forefront of the industry's move toward carbon neutral printing practices. Specifically, they assert that if demand for ecologically responsible materials increases, then the cost for the materials will decrease. The initial investment in eco-friendly practices will make them affordable for the industry as a whole in the long run.

Other research methods in this paper included a survey distributed to PubWest and IBPA members which was conducted to gain a baseline understanding of what current eco-friendly practices publishers have in place. After detailing and analyzing the results of the survey, a list of recommendations for publishers to reference as they strive to be carbon neutral and commit to environmental stewardship was created.

The most important change that can be made is to switch to 100% post-consumer waste (PCW) paper in all printing. Besides changing paper practices, rethinking labor practices within the industry can have a significant impact on reducing emissions. By shifting to digital editing and production methods, as well as limiting excess inventory, the carbon emissions released from labor, shipping, and distribution can be reduced.

¹ Ford, "Carbon Neutral Paper: Fact or Fiction?" 2-4.

Research Question

What needs to be done to make book printing truly carbon neutral by 2050?

Literature Review

When it comes to the use of recyclable or greener practices in the publishing industry, there are several factors that come into play when considering materials in the printing process. Not every issue can be addressed in this paper, nor does the industry currently have enough data gathering infrastructures to answer this question, but we have highlighted what we consider to be the most important issues.

Carbon Neutrality

Carbon neutrality is a difficult concept to pin down 1) because of how we currently categorize our fuel sources, and 2) how you look at the system of production as a whole versus looking at results and direct applications of it.² “[T]he notion of carbon neutral paper essentially assert that the paper . . . has no negative impact on the climate and ‘adds no carbon dioxide to the atmosphere.’” Carbon neutrality means that no fossil fuels can be used to create the product; no activities can interfere with forest ecosystems’ abilities to sequester and store carbon; and no other greenhouse gasses, such as methane, are released.³ With how the publishing and printing infrastructure is currently set up in the US, there is no way to produce truly carbon neutral products. But, that does not mean publishers cannot aim for producing low carbon products in the now and short-term, and working towards a goal of carbon neutrality in the long term.

Material

When discussing materials related to the printing process, the main items to consider are paper, ink, and binding materials like glue or cloth and leather. The material prices, manufacturing and handling, and distribution are primarily handled by mills, paper brokers, and printing presses. The actual publishing house and their commission for a print is the final stage in this process. Mills and paper brokers largely determine the price of paper based on the availability of resources and how great the demand is, and then presses process the material.⁴

² European Parliament, “What is carbon neutrality and how can it be achieved by 2050?” In the Society section, <https://www.europarl.europa.eu/news/en/headlines/society/20190926STO62270/what-is-carbon-neutrality-and-how-can-it-be-achieved-by-2050>. Last modified June 24, 2021. Tara Bernoville, “What is the difference between carbon-neutral, net-zero and climate positive?” *PlanA Academy*, <https://plana.earth/academy/what-is-difference-between-carbon-neutral-net-zero-climate-positive/>, Published June 8, 2021.

³ Ford, “Carbon Neutral Paper: Fact or Fiction?” 2-4.

⁴ Jessicah Carver, Natalie Guidry, Melissa Brumer Kossick, and Janine Winters. “Part I: A Book’s Life,” and “Part II: Out-of-House Production,” In *Rethinking Paper & Ink: The Sustainable Publishing Revolution*, 13-58 (Portland, Or: Ooligan Press, 2011.) Sonia Moore and Karla Olson. Interview with Patagonia via Zoom. Interviewed by Rachel Done, Rebecca Gordon, Megan Jessop, Stephanie Johnson Lawson. February 10, 2022. Joe Biel, “Printing Books: How to Make the Package Match the Product,” in *A People’s Guide to Publishing: Build a Successful, Sustainable,*

To understand how carbon neutrality can be achieved in the publishing industry, there are several key concepts and terms that people should know:

Ink

Most commercial inks are chemical and alcohol based. Many of these inks are toxic and can produce harmful gasses, usually collectively called volatile organic compounds, and are hard to dispose of. There are “greener” options such as vegetable based inks made from soy or canola, but there is currently no solution for a completely renewable, self-sustaining, non-toxic ink source in the industry. However, algae and uv inks may prove promising in the future. In short, vegetable inks are better for the environment overall, but they are not a perfect solution.⁵

Virgin Paper

This is paper that is fresh from the mill, and has never been used before in any production.⁶ Producing virgin paper requires “4.25 metric tonnes of emissions in carbon dioxide per tonne of product, [versus] just over 0.25 metric tonnes for 100% PCW paper.”⁷

Post Consumer Fiber/Waste (PCF/W) Paper

This paper is made out of pulp from recycled paper. Mills and printers usually offer different percentages of composite papers made of this material, i.e 25% of PCW and 75% virgin paper, or 100% PCW. “Every ton of 100% recycled fiber copy paper saves 17 million BTUs over virgin paper, enough to power the average U.S. home for more than two months.” This is one of the main areas where change can be made, and waste can be reduced by using as much PCW as possible.⁸

Meaningful Book Business From The Ground Up, (Portland: Microcosm Publishing, 2018,) 91-117. Ford, “Carbon Neutral Paper: Fact or Fiction?” *Environmental Paper Network*, 2009, .

⁵ Moore and Olson, Interview. “Soy-Based Inks vs. Petroleum-Based Inks,” PS Print by Deluxe, in Design & Printing, General, accessed March 4, 2022.

<https://www.psprint.com/resources/soy-based-inks-vs-petroleum-based-inks/#:~:text=Petroleum%2Dbased%20ink%20Petroleum%2Dbased.including%20toluene%2C%20benzene%20and%20xylene>. “What is the Most Sustainable Ink? (In 2022,)” EcoEnclose, in Enclose Blog. Last Modified February 7, 2022.

<https://www.ecoenclose.com/blog/what-is-the-most-sustainable-ink/>. “Soy Ink: Myth vs. Reality.” Anne Michelsen, *Triple Pundit*, in the Leadership & Transparency section. Last modified January 30, 2013.

<https://www.triplepundit.com/story/2013/soy-ink-myth-vs-reality/54451>. There is even discussion, that due to the oxidation of vegetable based ink, it can make the paper harder to recycle depending on how old the product is, versus conventional inks. Carver, Guidry, Kossick, and Winters, “Rethinking Paper & Ink: The Sustainable Publishing Revolution.”

⁶ Carver, Guidry, Kossick, and Winters, “Rethinking Paper & Ink: The Sustainable Publishing Revolution,” 25.

⁷ Ford, “Carbon Neutral Paper: Fact or Fiction?” 3.

⁸ Sergio Baffoni, “Responsible Fiber Sourcing.” In *The State of the Global Paper Industry*, ed. Carver, Guidry, Kossick, and Winters, “Rethinking Paper & Ink: The Sustainable Publishing Revolution,” 16. Mandy Haggith and Joshua Martin. Environmental Paper Network, 2018, 45.

https://environmentalpaper.org/wp-content/uploads/2018/04/StateOfTheGlobalPaperIndustry2018_FullReport-Final-1.pdf. Ford, “Carbon Neutral Paper: Fact or Fiction?” 5.

Print & Plant

This is a method put in practice by publishers where a new tree is planted for every one tree that is cut down for printing. It is one of the most common practices used by “green” committed presses and publishers. While this solution does limit carbon emissions to a degree by trying to upkeep carbon sinks, it is not enough in the long-term. There are a variety of logistical issues involved in this process, such as the health of the tree being planted, the type of trees used, whether it will grow enough to be harvested again, forest fires, and so on. Only 50% of trees that are cut down actually get turned into paper; most are used for fuel. Research shows that the older a tree is, the more carbon they will absorb versus younger trees, like we see in old growth forests. Simply put, though this may seem like a good start, there are other solutions that make a bigger impact in terms of carbon neutrality.⁹

Pulping

This term is used to describe one of two processes: either the practice of pulping timber into making paper, or the action of taking books that have already been printed and bound and then destroying them. The latter is done for a variety of reasons, but mainly happens when books are deemed not to be of “sellable” quality.¹⁰ The pulp from previous books is typically not reusable to make PCW paper. The glue and ink used to bind the book, as well as the infrastructure of the press, are what determine this factor. Ironically, “the burning of trees for energy for pulping is the single biggest source of emissions by the industry (40%),” yet the actual making of paper from PCW is more efficient in the long term for both materials and energy. This is a huge portion of waste that can be used in the industry. Publishers could help stop the hemorrhaging of resources. This would be possible by changing certain industry practices, choosing recyclable materials, and investing in recycling and press infrastructure.¹¹

Waste Run Off/Emissions

Every production industry produces some kind of waste byproduct. For presses, this generally includes paper clippings and fibers, contaminated water via the chemical baths for the paper and pulp, ink residue, fuel, electricity, methane and CO2 gasses. The pulp and paper industry are one the largest pollutants for the environment, producing large amounts of sulfur dioxide, nitrogen oxides, mercury, and other carcinogens. Other than the use of harvesting and using paper, this is the factor that has the biggest ecological impact.¹²

⁹ For more information as to why printing and planting is not a long term solution, one should read Ford’s work, as well as Haggith and Martin. Bernoville, “What is the difference between carbon-neutral, net-zero and climate positive?” European Parliament. “What is carbon neutrality and how can it be achieved by 2050?” Carver, Guidry, Kossick, and Winters, “Rethinking Paper & Ink: The Sustainable Publishing Revolution,” 16, 26-7. Ford, “Carbon Neutral Paper: Fact or Fiction?” 1-3, 8-11. Mandy Haggith and Joshua Martin, ed, “The State of the Global Paper Industry,” *Environmental Paper Network*, 2018. https://environmentalpaper.org/wp-content/uploads/2018/04/StateOfTheGlobalPaperIndustry2018_FullReport-Final-1.pdf

¹⁰ Moore and Olson, Interview.

¹¹ Ford, “Carbon Neutral Paper: Fact or Fiction?” 2. Carver, Guidry, Kossick, and Winters, “Rethinking Paper & Ink: The Sustainable Publishing Revolution,” 16, 28-33. Haggith and Joshua Martin, ed, “The State of the Global Paper Industry,” 5. Moore and Olson, Interview.

¹² See above, and footnotes 8 and 9.

Energy

The majority of energy consumption in the publishing industry is used by the mill and press. This is hardly shocking considering that paper production is the third highest industry in the consumption of fossil fuels.¹³ It is also one of the heaviest users of freshwater, and is also the second largest emitter of gasses in production. Not to mention the fact that paper is the single largest component of landfills in the US.¹⁴ In order to reach carbon neutrality, careful consideration needs to be given to what energy sources are used and environmental stewardship needs to be emphasized.

Capital

For the purposes of this project, we defined “capital” as the monetary return on investment for publishers to shift to carbon neutral printing options. Energy and labor appear to be the most impactful to changes in the prices of materials. More environmentally friendly options for energy and materials currently result in higher costs.¹⁵ However, some industry professionals believe that if the demand for more carbon neutral materials increases, the cost for the materials will decrease.¹⁶ The ultimate goal is to have eco-friendly materials used as the standard for the industry across the board.

Patagonia, for example, works with a specific paper broker in Canada that is built next to a dump so that they not only do they use recycled paper, but that they work with a company that aims for environmentally friendly practices by turning gasses from the dump into a renewable energy source to power their paper mill.¹⁷ If more publishers worked with more intentional paper brokers, they would decrease the negative impact on the environment and the cost of eco-friendly materials would go down.

The principal dilemma is that paper is the largest issue when it comes to producing waste. Without an increased demand from the publishers for printers to use recycled paper, PCW paper will continue to be expensive and deemed unaffordable. For this to change, companies need to prioritize the use of PCW paper. If imprints of the Big Four moved towards PCW paper, the pressure for others to follow suit would increase, causing prices to drop. Some like Macmillan are already doing so.¹⁸

While the initial increase in eco-friendly practices might cause a tighter budget in the immediate future, it would have long-term impacts that would eventually be less expensive. It might also increase investments into legislation to build infrastructure to process waste effectively.

¹³ Ford, “Carbon Neutral Paper: Fact or Fiction?” 1, 3-4.

¹⁴ Another resource for energy is biomass, see in Ford, “Carbon Neutral Paper: Fact or Fiction?” 1, 3-4, 6. Haggith and Joshua Martin, ed, “The State of the Global Paper Industry,” 5.

¹⁵Alataş, Sedat. “Towards a Carbon-neutral Economy: The Dynamics of Factor Substitution in Germany.” *Environmental Science and Pollution Research International* 27, no. 21

¹⁶ Moore and Olson, Interview.

¹⁷ See above.

¹⁸ Weisberg, Don. “Sustainability Is More than an Aspiration. It’s an Essential Part of Our Mission.” *Macmillan Sustainability*, 2022.

Labor

For the purpose of this research, labor includes those working in the printing industry, those working for the publishers (contract workers, freelancers, and distributors), and even the machines and tools used to print.

Labor has a significant impact on capital in the industry, therefore influencing how eco-friendly practices can be executed. Books International suggests that shifting to digital editing and production methods would minimize the carbon impact of labor. Using digital methods during pre-production can save a lot of time and paper by not using hard copies. Using PDF files for manuscripts, for instance, saves on both materials and fuel emissions at the same time.¹⁹ When it comes to warehouse and stock, the “print first, sell later” production model often creates a surplus that needs to be stored and transported. Shifting to “sell first, print later” would eliminate the need for storage, large print runs, and require less labor. Limiting “just in case” inventory would cut out a lot of time and carbon emissions due to vastly reducing the need for shipping and transporting the product.²⁰

Survey

Methods

To help conceptualize what current practices publishers have in place, we distributed a brief survey of multiple choice and short answer questions to people working in the industry. The survey first went out to Pubwest members via an anonymous link in a listserv email on February 8, 2022. On February 18, the same anonymous survey link was distributed to IBPA members via their weekly newsletter (see Appendix).

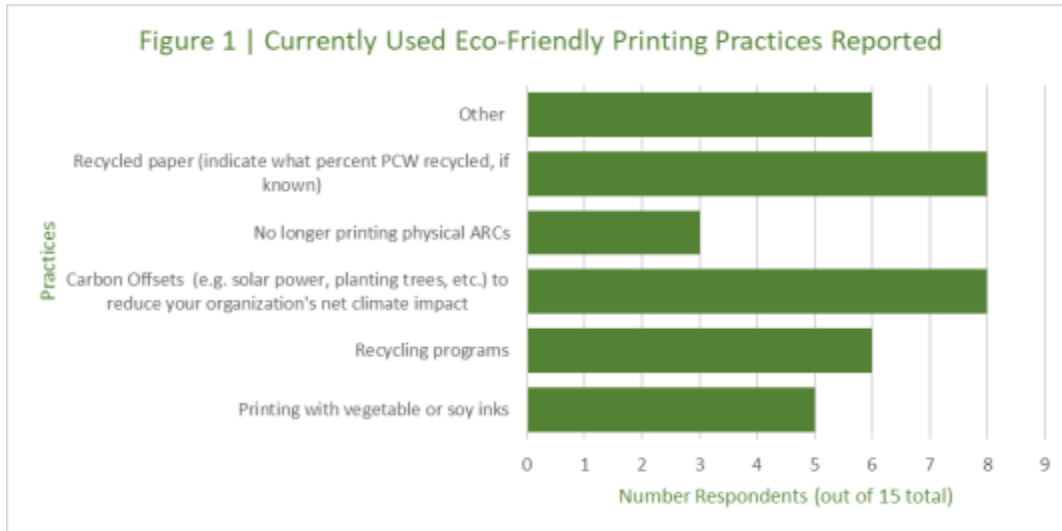
Results and Discussion

As of March 2, 2022, we received fifteen total responses. The survey subjects were first asked to identify their role in the industry to help determine how many of them were directly related to printing or publishers. Eleven respondents identified as publishers, one identified as a printer, one identified as an associate publisher, and two were unknown.

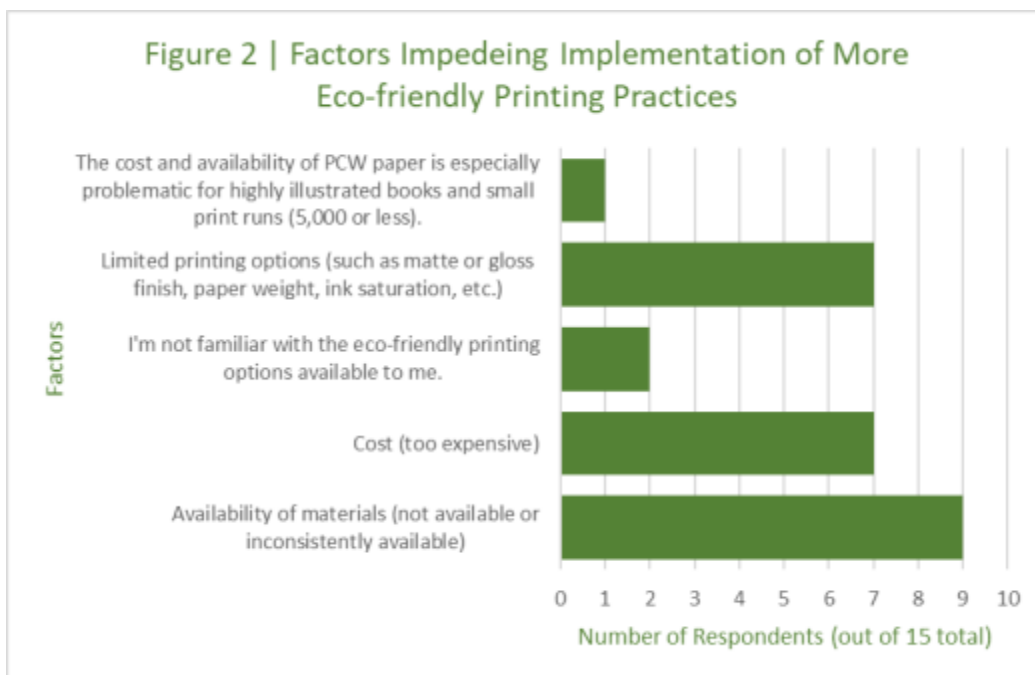
The second question asked whether the organization they worked for provided a written ecological promise, mission, or code. This revealed a snapshot of the publishers’ mindset. One third of the respondents, four of which identified as publishers, responded no. Three respondents said their company had one in development, one of whom had identified as a printer. One publisher indicated that there was an informal, unwritten commitment. The remaining six, roughly one half of the total respondents, answered yes.

¹⁹ “Carbon Balancing in Action + Fall Conferences,” Supply Chain, Sustainability, and Headcaps! (Studiolo Secondari, February 22, 2022).

²⁰ “Carbon Balancing in Action + Fall Conferences,” Supply Chain.



The third question asked respondents to choose all that applied from a list of eco-friendly printing practices implemented by their organization. The results can be seen in Figure 1. The most commonly reported practices were carbon offsets and recycled paper. It is important to note that paper recycling and carbon offsetting are nuanced practices. The second highest results were recycling programs and other, followed by the use of vegetable or soy inks, and then the stoppage of printing and distributing advanced reader copies (ARCs) of their new books. As for the respondents who reported using recycled paper, only two reported using 100% PCW paper for printing.



Question four asked what factors kept them from implementing eco-friendly practices. Results can be seen in Figure 2. One respondent who replied “other” stated that "the cost and availability of PCW paper is especially problematic for highly illustrated books and small print runs (5,000 or less)."

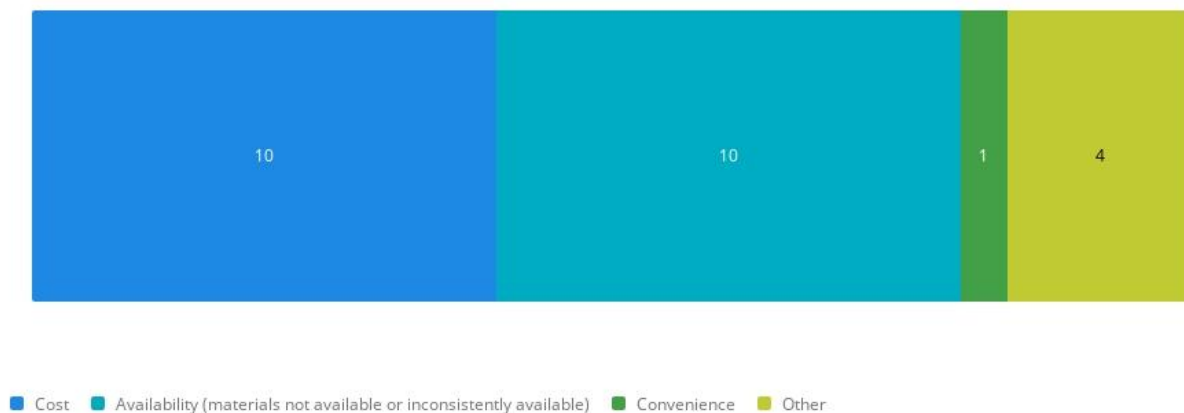
Questions five and six asked about pulping practices. Respondents typed in short answers. We received a total of eight responses to both questions, which can be seen in Figures 3 and 3.1, found in the Appendix. When asked if they track how many books are pulped, 4 respondents reported that they do not, but the majority do. When asked about practices in place to avoid pulping, we received several responses including decreasing print runs and donating books. Two respondents stated that they practice remaindering, which is when publishers sell books at heavily reduced prices to bargain shops in order to clear out their inventories. The seventh question asked what factors limited their ability to make books out of 100% recyclable materials. Figure 4 displays the results. The most common answers were related to the cost and availability of the materials.

Figure 3 Do you keep track of how many books you pulp due to damages and returns? How?	Responses
No	4
Yes	1
Yes, through our warehouse reports	1
Our distributor does this for us	1
Yes, distributor provides this information	1
Pulp very few books. Only damaged ones.	1
The publisher does, though I'm not sure how and what the numbers are.	1
We do.	1

Do you have any practices in place to avoid pulping books? If so, what?	Responses
No	2
Yes, we sell hurts to partners.	1
Yes	1
We're modest with print runs and don't agree to promotions with mass merch accounts that don't have a track record of high sell through	1
Remaindering and re-selling old stock to authors	1
Yes, we attempt remaindering and donating before recycling.	1
We do not have a specific initiative for recovering books, but try to prevent waste by ordering in small print runs and reprinting after the first print run is close to selling out so we know how the book has been received, where we can sell it, etc.	1
Yes. We remainder; we print fewer books; we are very careful with inventory.	1
We rarely pulp and instead offer them as premiums to customers.	1
We try to print conservatively so that first print runs are around a 1-year supply, with reprints on autoprint thereafter for most titles. Books printed as cloth only first go through the NIP process but then autoprint thereafter to keep stock in line with demand.	1

The final question asked people to answer on a scale of 0-5 what factors influenced their decision-making when it came to following eco-friendly practices in their organization (see Figure 4). It is interesting to note that the majority of the respondents said that eco-friendly practices only somewhat impact business decisions.

Figure 4 | Factors Limiting Ability to Make Books Out Of 100% Recyclable Materials



A major limiting factor with our survey is that only fifteen people responded. This offers an extremely small sample size compared to the entire publishing industry. The survey was kept short and simple in the hopes that people would be more willing to respond, but it was unsuccessful. To gain more reliable and significant information, hundreds of responses are needed. Because of the limited numbers, our research can only account for a tiny fraction of the industry as a whole. Given additional time, the survey would have been better advertised and left open longer to gain more responses.

Our results show that there are some publishers that do not prioritize ecological awareness and sustainability in their decision making process and outward image. If we are going to make progress toward our lofty goal of being carbon-neutral by 2050, we will need to meet publishers where they are.

Recommendations

There are many ways the industry can begin to work towards carbon neutrality. While this is not an exhaustive list of all the options out there, these recommendations are a good place for publishers to start working towards greener practices. There are also several examples of businesses already fostering environmental stewardship such as Rolland Sustana Group, Cascades, and Hemlock. Publishers that already operate greener business include Patagonia, Chelsea Green, Macmillan, and Berrett-Koehler.²¹

Karla Olson, the publisher at Patagonia, believes that the most impactful area to start with is working with 100% PCW recycled paper.²² As mentioned previously, paper is one of the largest contributors to waste, as well as a large contributor to power consumption. Changing the type of paper used will greatly increase the industry's carbon neutrality, especially if the green practices of the paper mill are taken into consideration as well.

Aside from changing paper type, the amount of paper used can also be minimized. MacMillain's director of sustainability and business partnerships, Bill Barry, says that they achieve this by using thinner paper, which reduces the amount of fiber that goes into each book, therefore reducing the weight of materials being transported. They found that going from a typical 45-pound basis weight paper to a 40-pound basis paper gave them an 11% savings on paper

²¹ For companies interested in looking at their own structures and how to improve them, there is the B-Crop certification process, as well as Canopy: <https://canopyplanet.org/about-us/>. Carver, Guidry, Kossick, and Winters, "Rethinking Paper & Ink: The Sustainable Publishing Revolution." Berrett-Koehler Publishers, "About Us," accessed March 6, 2022, <https://www.bkconnection.com/home/bk-community-menu/about-berrett-koehler-publishers?redirected=true>. Cascades, "Sustainable Development," accessed March 6, 2022, <https://www.cascades.com/en/sustainable-development>. Chelsea Green, "New Mission About Us," accessed March 6, 2022. <https://www.chelseagreen.com/about/new-mission-about-us/>. Ford, "Carbon Neutral Paper: Fact or Fiction?" Hemlock, "Sustainable Operations," accessed March 6, 2022, <https://www.hemlock.com/sustainability/sustainable-operations/>. Macmillan, "About Us," accessed March 6, 2022. <https://sustainability.macmillan.com/>. Moore and Olson, Interview. Rolland Sustana Group, "About us," Accessed March 6, 2022. <https://www.rollandinc.com/>

²² Moore and Olson, Interview.

weight alone.²³ Thinner paper can also factor into lower costs for distribution because using less wood and having lighter weights lowers transportation costs.²⁴ Houses such as Scholastic are also trying to use less paper, increase the use of recycled paper, and use more paper certified by the Forest Stewardship Council, which ensures that paper comes from companies that manage their lands responsibly, as well as pay attention to biodiversity and worker rights.²⁵ In addition to paper type, trim-size should be considered when determining cost effectiveness and sustainable printing options.

Another way to minimize the use of paper is to utilize print on demand options rather than running large print runs. Printing smaller runs that align more closely with sales projections and then printing more as needed is, however, impacted by current supply chain issues, creating delays in getting products to buyers.²⁶

There are several undervalued sources the industry can look to for energy such as water, solar, and wind power. Trapping methane gasses from landfills and implementing them in a closed-loop process is also a good way to reuse the gas and minimize its environmental footprint.²⁷

For those who are unsure of where to start, a climate change firm can be hired to assess what areas of the company are producing the highest carbon emissions. If hiring someone to do so is too expensive, there are also excellent resources out there to help publishers calculate their own emissions.²⁸

All of these recommendations are just the tip of the iceberg. For more in depth information on eco-friendly printing practices, please consult our bibliography.

Conclusion

Achieving carbon neutrality in the book printing industry by 2050 is a lofty goal. Due to the lack of investment in eco-friendly infrastructure by publishers, the costs of switching to greener practices are currently high. Options are out there, however, for changing how the industry currently works. If companies invest in research and the development of more sustainable practices, the cost of going green can flip from too expensive to just right. At this point it is up to the publishers to commit to environmental stewardship and carbon neutrality and eat the early costs of this transition. Some organizations are making steps toward this goal, but many more need to join in to make the goal a reality.

²³ Ro, "Reducing the Environmental Toll of Paper in the Publishing Industry." 2021

²⁴ See above.

²⁵ Springen, Karen. "Are Children's Publishers Destroying Rainforests?" PublishersWeekly.com, June 24, 2010.

²⁶ Senjuti Patra, "The Cost of Reading: The Book Industry's Carbon Footprint," BOOK RIOT, February 18, 2022

²⁷ Ford, "Carbon Neutral Paper: Fact or Fiction?"

²⁸ Guy Dauncey provides an excellent template for making your own calculations in his guide "Going Carbon Neutral."

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Appendix

Survey Results

[Survey Results_Industry Report.csv](#)

Survey Questions

1. What is your role in the industry?
 - a. Publisher
 - b. Printer
 - c. Other _____
2. Does your organization have a written ecological promise, mission, or code?
 - a. Yes: Formal and written
 - b. Yes: Informal and unwritten
 - c. Currently in development
 - d. No
 - e. Unsure
3. What eco-friendly printing practices does your organization use? Check all that apply.
 - a. Recycled paper
 - b. Printing with vegetable or soy inks
 - c. Recycling programs
 - d. Carbon Offsets (e.g. solar power, planting trees, etc.) to reduce your organization's net climate impact
 - e. No longer printing physical ARCs
 - f. Other _____
4. What factors have kept you from implementing more eco-friendly practices within your organization? Check all that apply.
 - a. Cost (too expensive)
 - b. Availability of materials (not available or inconsistently available)
 - c. Limited printing options (such as matte or gloss finish, paper weight, ink saturation, etc.)
 - d. I'm not familiar with the eco-friendly printing options available to me.
 - e. Other _____
5. Do you keep track of how many books you pulp due to damages and returns? If so, how?
 - a. Yes: Please provide a short answer below.
 - b. No
6. Do you have any practices in place to avoid pulping books? If so, what?
 - a. Yes: Please provide a short answer below.
 - b. No.
7. What factors limit your ability to make books out of 100% of recyclable materials?
 - a. Cost (too expensive)
 - b. Availability of materials (not available or inconsistently available)

- c. Other _____
8. To what degree do environmental factors influence decision-making in your organization? (use a scale 0-5)
- a. Our ecological awareness is an important part of our image and we want our customers and suppliers to be aware of our commitment to sustainability by showing actual changes in performance.
 - b. Our measures of sustainability guide decision-making at the business unit/functional unit level (for example, supply chain, R&D, HR, etc.)
 - c. Our measures of sustainability guide day-to-day decision-making at the implementation level (design design decisions, supplier selection, etc.)

Interview Questions

- What questions should publishers ask printers in order to be as eco-friendly as possible?
 - What questions should we ask in regards to printing options, waste, and returns?
- What does your profit-loss margin look like when investing in eco-friendly methods of printing and distribution?
- If it is not possible to go 100% carbon neutral, what steps can be taken to achieve partial carbon neutrality?
- Do you keep track of pulping and recycling their books? If so, how do you do this?
- What percentage of your waste comes from damages, returns, and pulping?