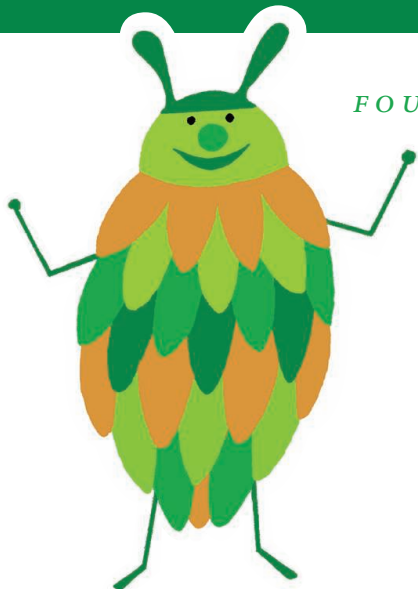


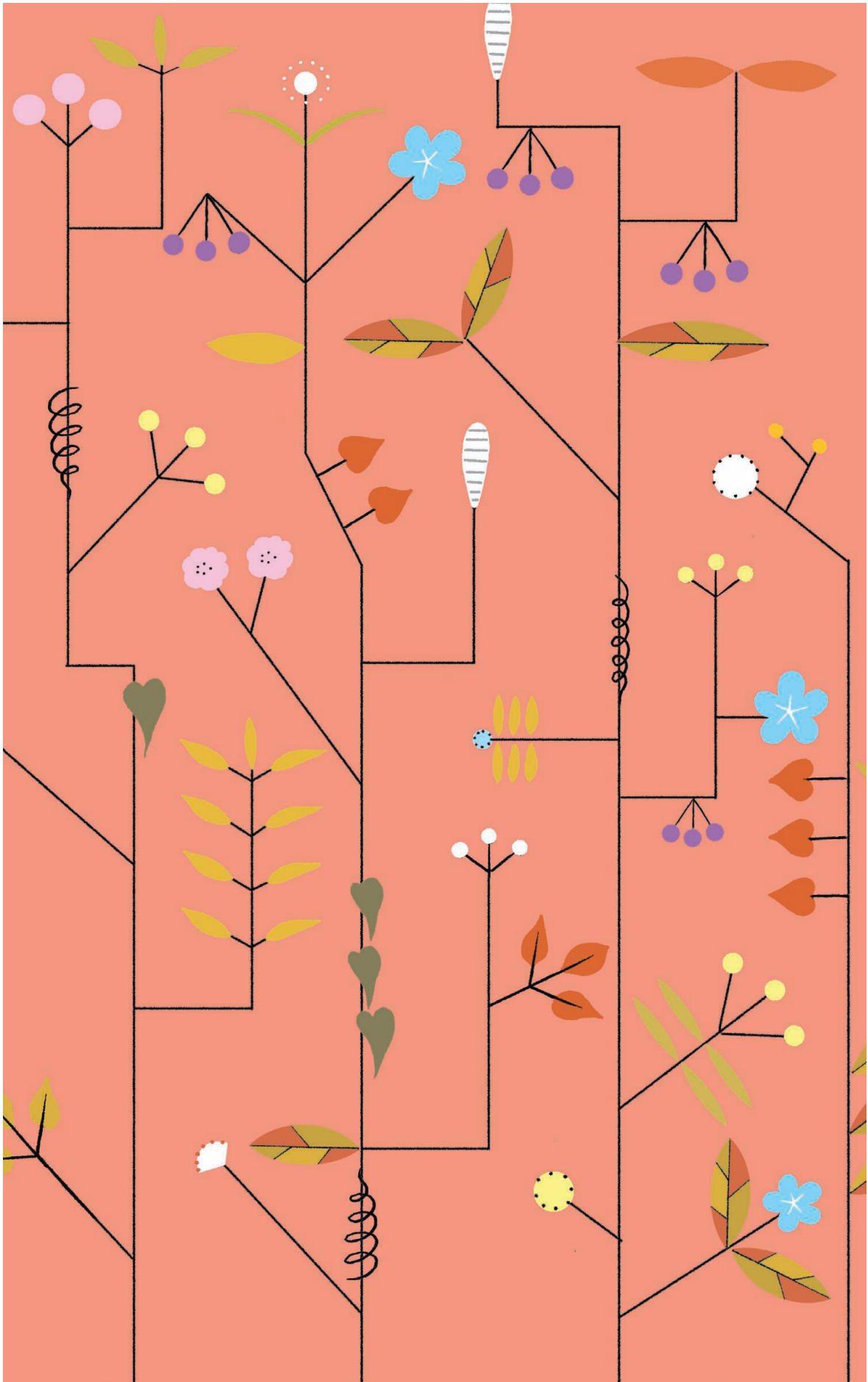
A Field Guide

Eco-Friendly, Efficient and Effective Print

FOURTH EDITION



Monadnock 



Responsible Paper Sourcing By Design

INTRODUCTION

Responsible sourcing is a critical component of any comprehensive sustainability initiative. The purpose of this guide is to offer information in support of sustainable design and print for promotion, packaging and environmental graphics. For consideration is not just the material but also how it is made and what happens when it reaches the end of its useful life.

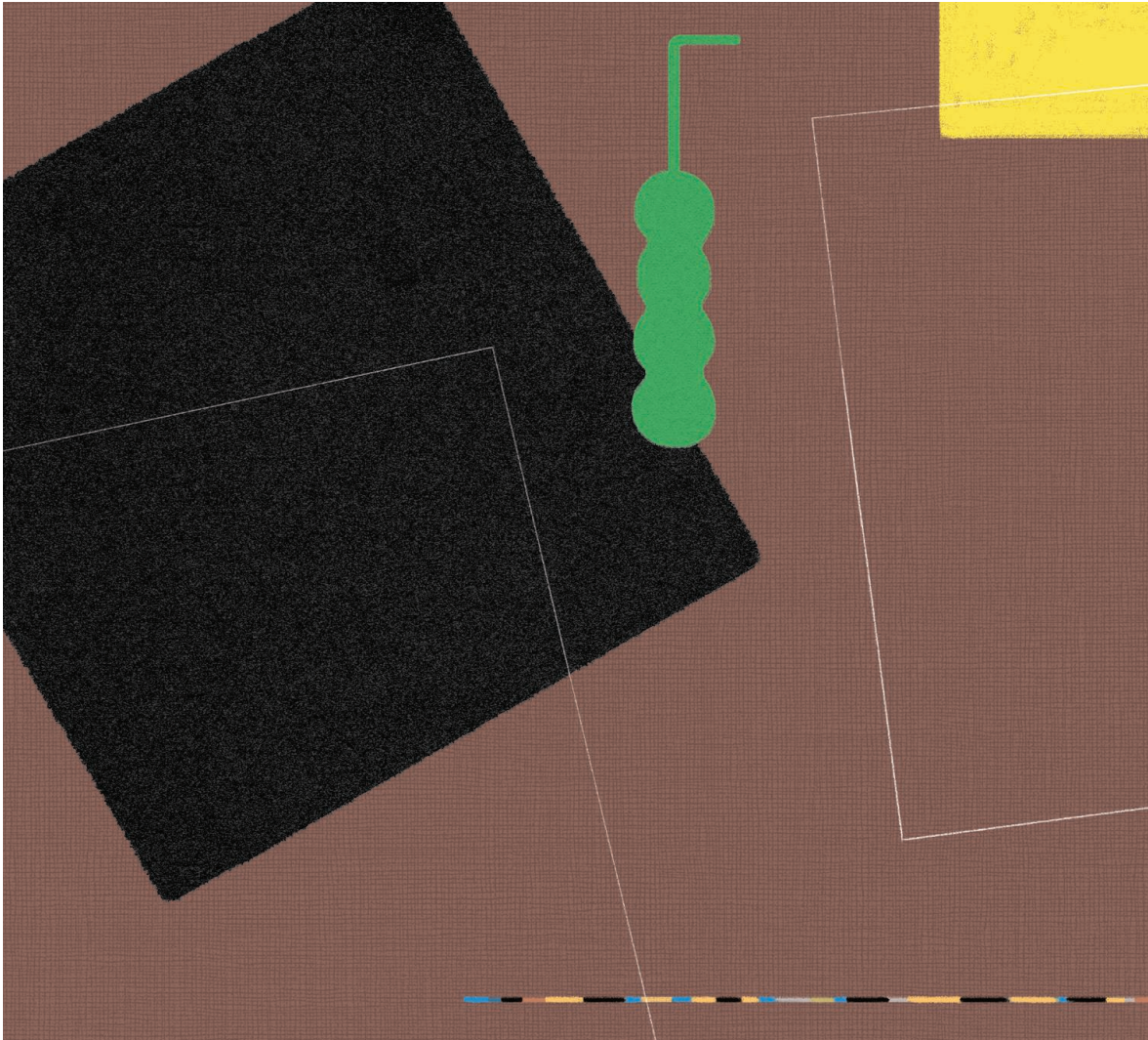
Performance. Aesthetics. Economics. Environment.
You don't have to compromise with eco-friendly design.

This guide gives marketing, design and sourcing professionals the opportunity to think differently about their choices. The message is four-fold: it must satisfy its purpose, be cost-effective, be environmentally sustainable and be effective in a visually meaningful way.

If something is going to be printed,
it should be extraordinary, enduring
and sustainable.

IN THIS FIELD GUIDE

Paper
Production
Inks
Printing
Finishing
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Waste
How to Say It
Health & Wellbeing
Opportunities
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Paper

The manufacture of paper requires the use of natural resources. How much and how efficiently those resources are used depend quite a bit on the processes manufacturers use in resource acquisition and production. By obtaining tree fiber from sustainable sources, by using water judiciously and responsibly and by making renewable energy choices, manufacturers and their suppliers can drastically reduce the size of their environmental footprint.

Over the last several decades, foresters, environmentalists and paper manufacturers have made great strides to reduce the impact from manufacturing paper and protecting forestland and wildlife habitat, managing natural resources for sustainability, and maintaining air and water quality. Designers can make a difference by choosing manufacturers who subscribe to these best practices.

Paper is manufactured with a range of differing fiber content. Some can be made with fibers that are completely virgin or virgin with various blends of recycled fibers such as totally recycled or post-consumer recycled. Whether

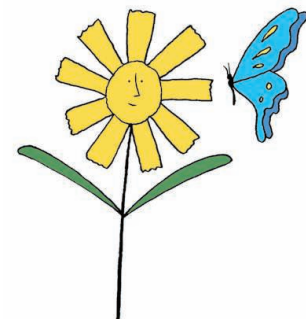
recycled papers or virgin papers are “better” for the environment is a matter of contention and depends upon several factors that include the environmental impacts associated with the collection and processing of paper and harvesting trees.

VIRGIN PAPER | Coming directly from trees, it contains the strongest and purest fiber. It obviously has the most immediate impact on the forest. However, that impact can be mitigated if the pulp is harvested from a forest or other source that is sustainably managed. Its first-generation status means that virgin paper has not undergone prior printing, which can make it the most chemical free depending on its bleaching process. When specifying virgin paper, care should be taken to ensure that the pulp comes from a sustainably managed source. Designers should include a note to end users encouraging recycling of printed pieces made with virgin paper, and this can be done by using the recycling Mobius commonly known as the chasing arrow symbol.

RECYCLED PAPER | Recycling allows the same fiber to be used and reused many times over. The recovery rate of paper in the U.S. in 2015 was 66.8%,¹ which makes paper one of the most recycled materials. Recycled fiber content may include pre-consumer waste, post-consumer waste (PCW), totally recycled fiber (TRF) or various blends of each. Recycled paper has dramatically improved in quality over the past decade, in most cases performing as well as virgin stock, and has become cost competitive.²

Claims do not have to be qualified if the entire piece is recyclable. Otherwise, state how much or what specific components can be recycled. The claim of recycled content can be made only on products manufactured from materials recovered during the manufacturing process (pre-consumer) or after they have served their intended purpose (post-consumer). The Federal Trade Commission stipulates that the distinction be made between pre-consumer and post-consumer content (see example at right).

Recycled content can be any blend of recycled paper fiber and may also contain some virgin paper fiber. Pre-consumer waste content paper contains fiber that was recycled from waste at a mill, fabricator and/or printer.



HOW TO COMMUNICATE PAPER CONTENTS

Recycled content is often expressed in an equation denoting its percentage of content. It is generally labeled with the total amount of recycled content first and the amount of post-consumer material second.

Example:



(100% recycled content, of which 30% is post-consumer waste)

Post-consumer waste (PCW) content paper contains fiber that has been in circulation in finished form and has been recycled by the end user. It is considered the most environmentally efficient since it has had at least one useful life before returning to service and contributes to the growing circular economy.

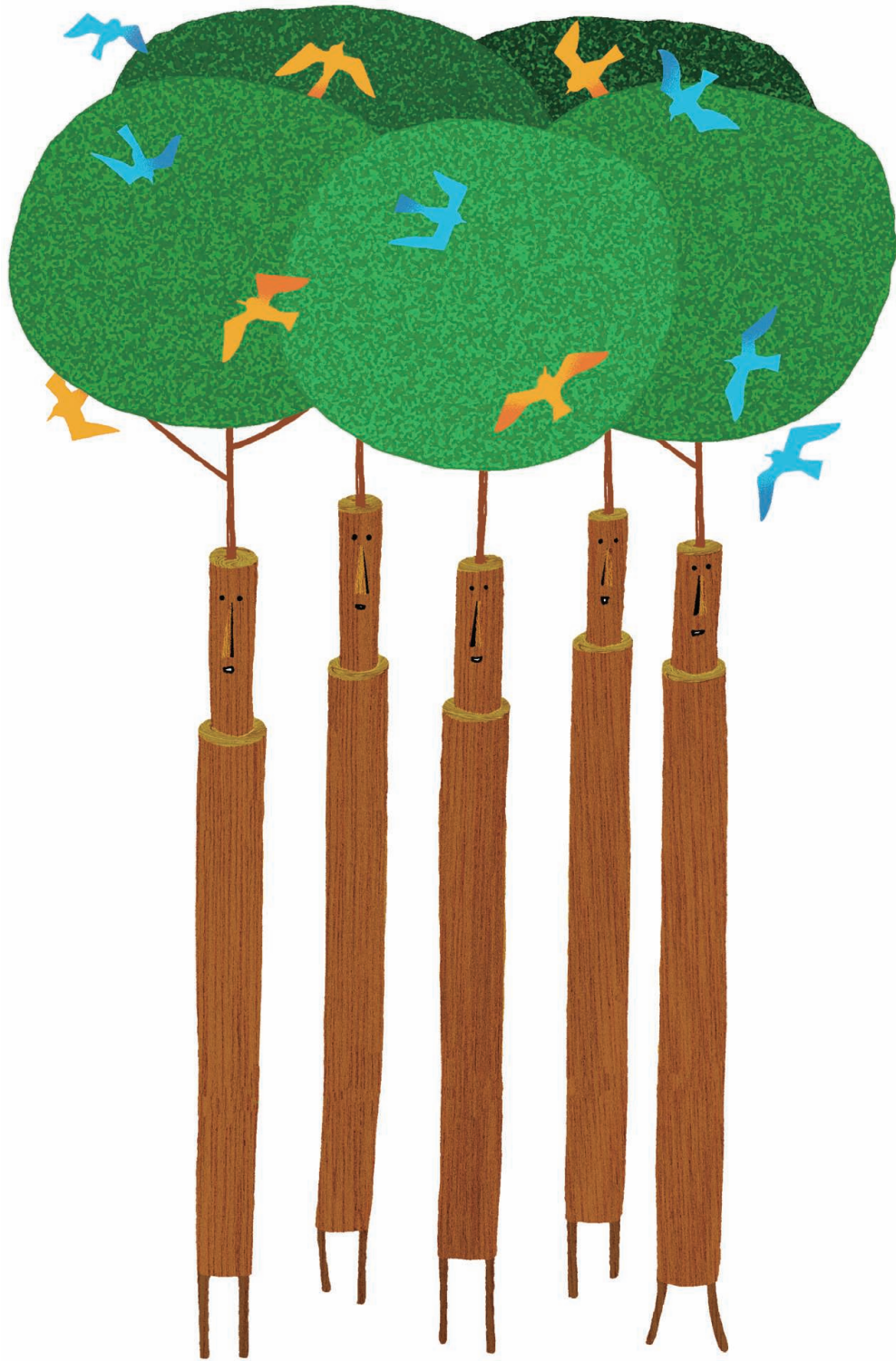
Totally recycled fiber (TRF) content paper contains 100% recycled material and may contain pre- and post-consumer recycled content.

TREE FREE PAPER | An alternative to wood pulp is plant fiber—either agricultural residue recovered from crops or fibers harvested from plants grown intentionally for tree-free paper. The most common are kenaf, hemp, flax, cotton and combinations thereof. In addition to their environmental value, plant fiber papers—especially kenaf and hemp, with their combination of long and short fibers—tend to be more durable.³ Containing less lignin than trees, kenaf requires fewer chemicals, takes less energy to process, is naturally acid free and can be recycled.⁴ One hundred percent cotton paper has low acidity and is frequently used for archival purposes.

Some papers are harder to recycle than others. If they are coated with plastic or aluminum foil, waxed or pasted they are often not recycled because of cost.



RECYCLE LOGO | This indicates that a product or package is recyclable and/or made with recycled materials. Use of the recycling logo is not regulated by law as it is in the public domain; however, the Federal Trade Commission does offer guidelines on environmental claims. Claims should be made in language that makes the environmental attributes clear. In addition to recyclability, claims can be made regarding ink used and paper processing (for example, to note soy ink content or the use of chlorine-free processing).



There are over

3 TRILLION TREES in the world.

Responsible forestry practices will help
that number increase in perpetuity!



Paper | Sourcing

It is easy for design professionals to identify and verify environmentally responsible pulp and paper sources. Two organizations operating in the United States that have established globally accepted responsible forestry standards are the Forest Stewardship Council® and the Sustainable Forestry Initiative. The presence of a third-party logo from these organizations ensures that the paper comes from a responsible source and performance to these standards is third-party verified by their respective accredited auditors. (These are distinct certifications and one may not be used in conjunction with the other.)

FOREST STEWARDSHIP COUNCIL (FSC®) | The presence of the Forest Stewardship Council chain-of-custody logo indicates that the materials used to produce the product or printed piece were sourced responsibly. Every entity that touches the product—from the logger to the printer—must be FSC certified. Designers and printers who wish to use the FSC logo or would simply like more information may contact the FSC. For more information, visit us.fsc.org.

The Rainforest Alliance is one of many certifiers that work with FSC to help companies incorporate sustainability into their sourcing strategies. It verifies compliance with FSC standards—that wood products do not negatively impact indigenous populations, come from conservation areas, come from genetically modified trees and are not illegally harvested. For more information, visit www.rainforest-alliance.org.

SUSTAINABLE FORESTRY INITIATIVE® (SFI®) | SFI Inc. is an independent, nonprofit organization that is solely responsible for maintaining, overseeing and improving the internationally recognized SFI program. The Sustainable Forestry Initiative combines environmental responsibility with sound business practices. Providers of wood and paper products, member companies plant over a million acres of trees per year.⁵ For more information, visit www.sfiprogram.org.

LOGO USAGE GUIDELINES

In most cases, the use of third-party trademarked logos requires approval. There may be other stipulations for use as well. For example, only those entities directly purchasing Green-e certified energy or certified energy credits may use the Green-e logo. For FSC, only when the chain-of-custody is complete may the finished product bear the FSC logo. Consult your paper supplier for assistance with third-party logos.

FSC ON PRODUCT LOGOS

<https://us.fsc.org/en-us/market/logo-use>



100%
Products containing material from FSC certified forests that meet the environmental and social standards of FSC.



Mix
Products with material from FSC certified forests, recycled material or other controlled sources.



Recycled
Products containing post-consumer material and may include some pre-consumer material.

FSC PROMOTIONAL LOGO



The mark of responsible forestry

RAINFOREST ALLIANCE CERTIFIED™ LOGO



Products managed in accordance with strict standards for social and environmental sustainability

SFI LOGOS

<http://bit.ly/2dDbynF>





Fair and Balanced

For a fair and balanced view of the impacts of paper choice, consult a variety of experts, like Canopy, SCP and AF&PA when making sourcing decisions. It has been argued that the added energy consumed in the recycling process negates any savings in the use of recycled paper versus virgin paper. Environmental Paper Network argues that there are clear benefits to recycled paper. Regardless, choose papers that bear third-party certification ensuring that it is made with responsibly sourced fiber.

RESOURCES

American Forest & Paper Association (AF&PA) is the national trade association of the forest products industry and advances public policies that promote a strong and sustainable U.S. forest products industry in a global marketplace. AF&PA is also the leader in cutting-edge policy information and mission-critical statistical and research data about the forest products industry.

afandpa.org/about

Canopy works to protect the world's forests, species and climate by collaborating with business leaders, scientists and decision-makers to help create sustainable supply chains and foster innovative solutions to environmental challenges.

canopyplanet.org

Earth911 is a community that helps consumers find their own shade of green, adopt environmentally sound practices and drive impactful environmental changes. They deliver a mix of targeted media content and recycling data so that you can live a happier, healthier, sustainable lifestyle.

earth911.com

Environmental Paper Network (EPN) offers an online calculator to quantify the environmental impacts of your paper choice.

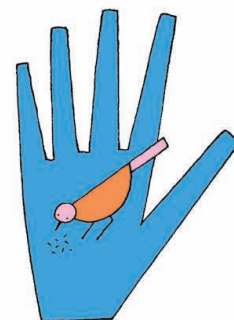
papercalculator.org

Sustainable Green Printing Partnership (SGP) advocates best practices and innovation among print community stakeholders, aligning the printing industry and its customers in the pursuit of a more accountable sustainable supply chain. SGP certifies printing facilities' sustainability best practices, including and beyond regulatory compliance.

sgppartnership.org/about

The Sustainable Packaging Coalition (SPC) is an industry working group dedicated to a more robust environmental vision for packaging. Through strong member support, an informed and science-based approach, supply chain collaborations and continuous outreach, it endeavors to build packaging systems that encourage economic prosperity and a sustainable flow of materials.

sustainablepackaging.org



Paper | Energy and Emissions

There are three ways to validly make a claim of using “renewable energy.” One is by purchasing green power directly from a renewable energy power supplier. The second is by purchasing Renewable Energy Certificates. The third is by utilizing renewable energy that is generated on site in the form of solar, hydro, geothermal, and/or wind power.

DIRECT PURCHASE | Manufacturers with facilities whose electrical grid is fed by green-power plants may be able to purchase energy directly from the utility. Electricity suppliers offer these products either as a percentage of electricity usage or in a fixed number of units or blocks of kilowatt-hours.

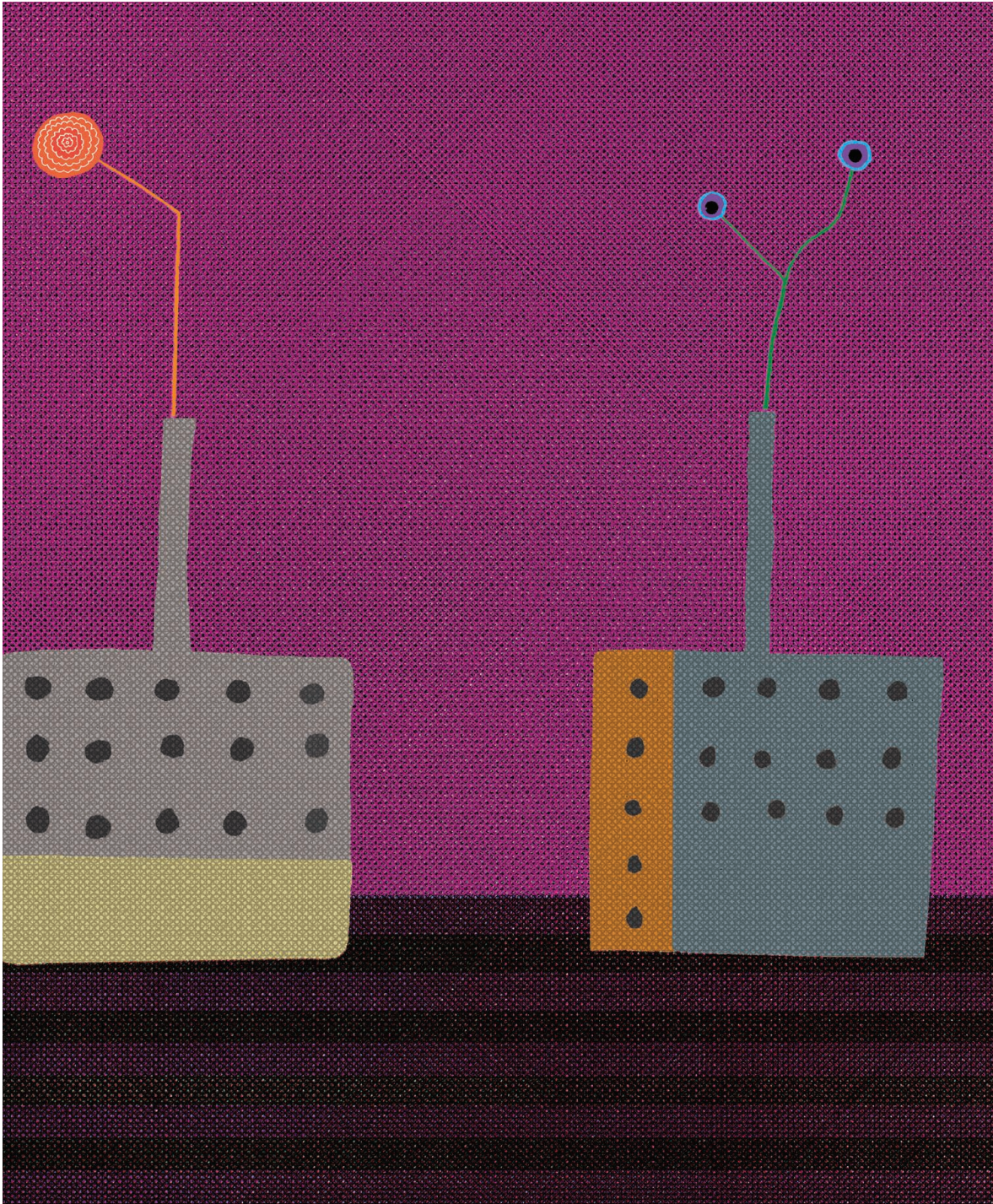
RENEWABLE ENERGY CERTIFICATES | Most paper mills achieve the claim of green power through the purchase of Renewable Energy Certificates (RECs). Renewable Energy Certificates provide a subsidy to develop new renewable energy sources such as wind, solar, geothermal, hydro-electric and biomass power plants. Many companies, environmental organizations and government bodies see REC subsidies as a long-term method of growing the renewable energy infrastructure. Third-party certification by organizations such as Green-e ensures a verified source of supply.

GREEN-E | The Green-e logo indicates use of certified renewable energy. Green-e is the nation’s largest independent certification and verification program for renewable energy. Eligible sources of supply include solar electric, wind, geothermal, low-impact hydroelectric, biomass, biodiesel and hydrogen fuel cell technology. For more information about Green-e certification for renewable energy, visit www.green-e.org.

ON-SITE GENERATION | Some paper mills use green power by actually producing their own renewable energy on site. This is accomplished in most cases by low-impact hydroelectric generation. Turbines are placed on an adjacent river to turn generators that produce electricity. Unlike the large-scale hydroelectric operations of the past, low-impact hydroelectric preserves the flow of a river, allowing it to maintain healthy oxygen levels while also allowing fish migration to occur. On-site generation has one immediate advantage over RECs because it lowers the demand on the power grid.

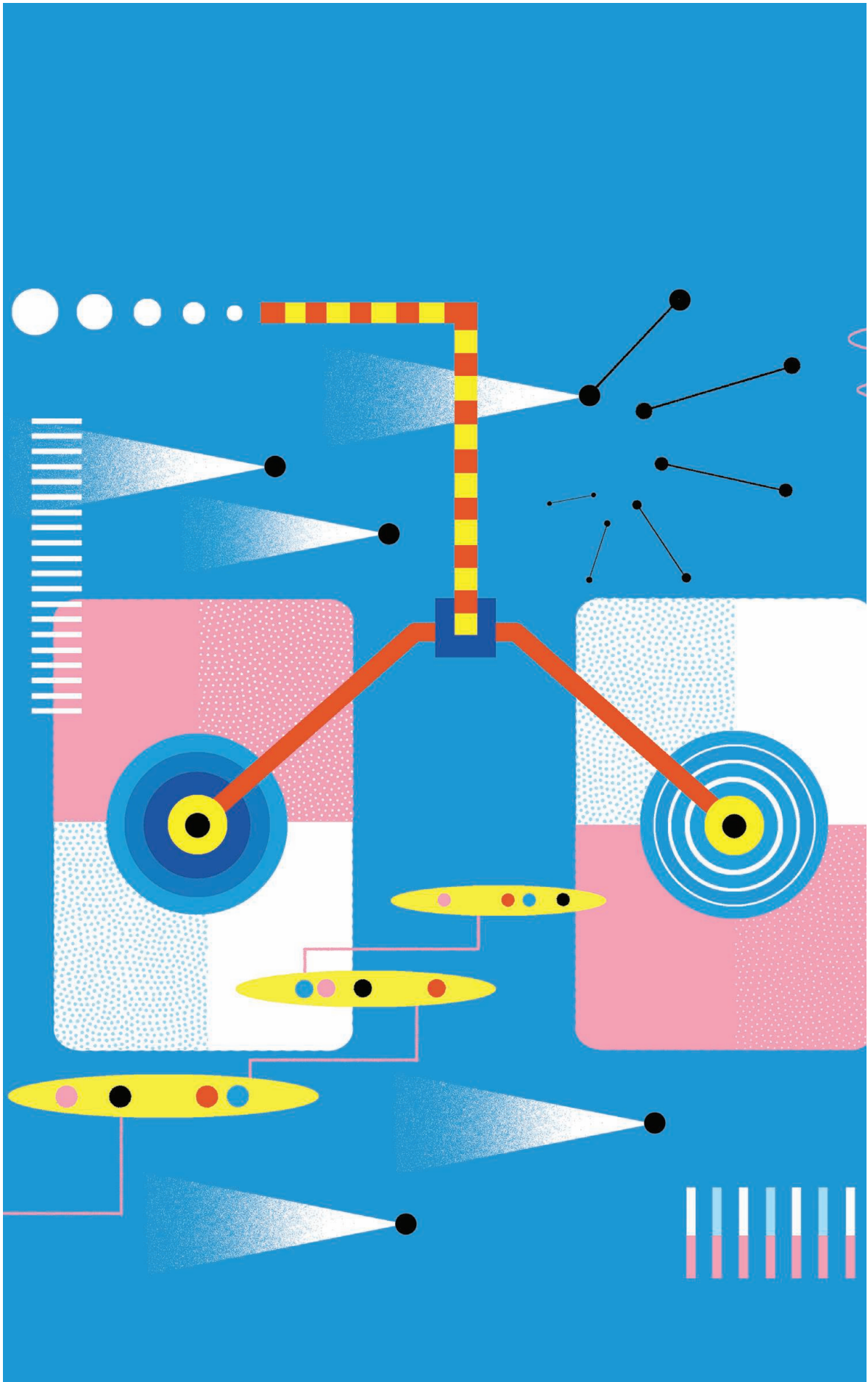
ENERGY AND EMISSIONS | One of the many advantages of renewable green energy is that it produces far fewer polluting emissions than traditional fossil-fueled power. It dramatically reduces carbon emissions. Wind, hydroelectric, solar and geothermal power sources all generate little if any carbon emissions after the emissions created by building the initial infrastructure are accounted for. Though some green energy methods, such as biomass fuels, use combustion and therefore release carbon, they still emit far less pollution than their coal and oil counterparts.

CARBON NEUTRALITY | As a response to global climate disruption and its impact on consumer behavior, manufacturers, corporations, government entities and even individuals are looking for ways to become “carbon neutral.” They are taking actions to reduce atmospheric carbon emissions in proportion to those generated by



their activities in business and daily life. This is generally accomplished in two ways: lowering carbon emissions directly by lowering consumption and by promoting activities that aid the natural process of carbon reduction such as preserving wilderness areas.

VERIFIED EMISSION REDUCTION (VER) | This is an intangible financial commodity issued when a carbon reduction project is completed. One VER represents one ton of CO₂ that has been reduced, sequestered or avoided through a third-party verified emission reduction project. Companies voluntarily purchase VERs to subsidize greenhouse gas reduction initiatives and to offset emissions from their own operations.



Paper | Environmental Management System

ISO 14001 CERTIFICATION | ISO 14001 is a core set of standards relative to environmental management. Companies adhering to this standard have established a formal environmental management system (EMS) with a commitment to quantify and reduce the environmental impacts of their operations. Before a certification is issued, compliance to the standard must be verified by an independent auditing organization. For more information about ISO 14001, visit www.iso.org.

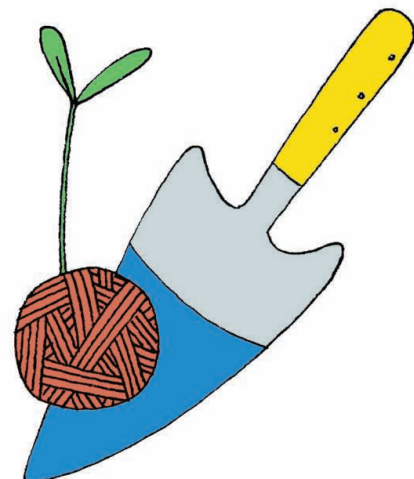
EPA PROGRAMS | The Environmental Protection Agency has several voluntary partnership programs that include the Green Power Partnership, WasteWise and SmartWay which provide useful tools to facilitate environmental impact reductions.

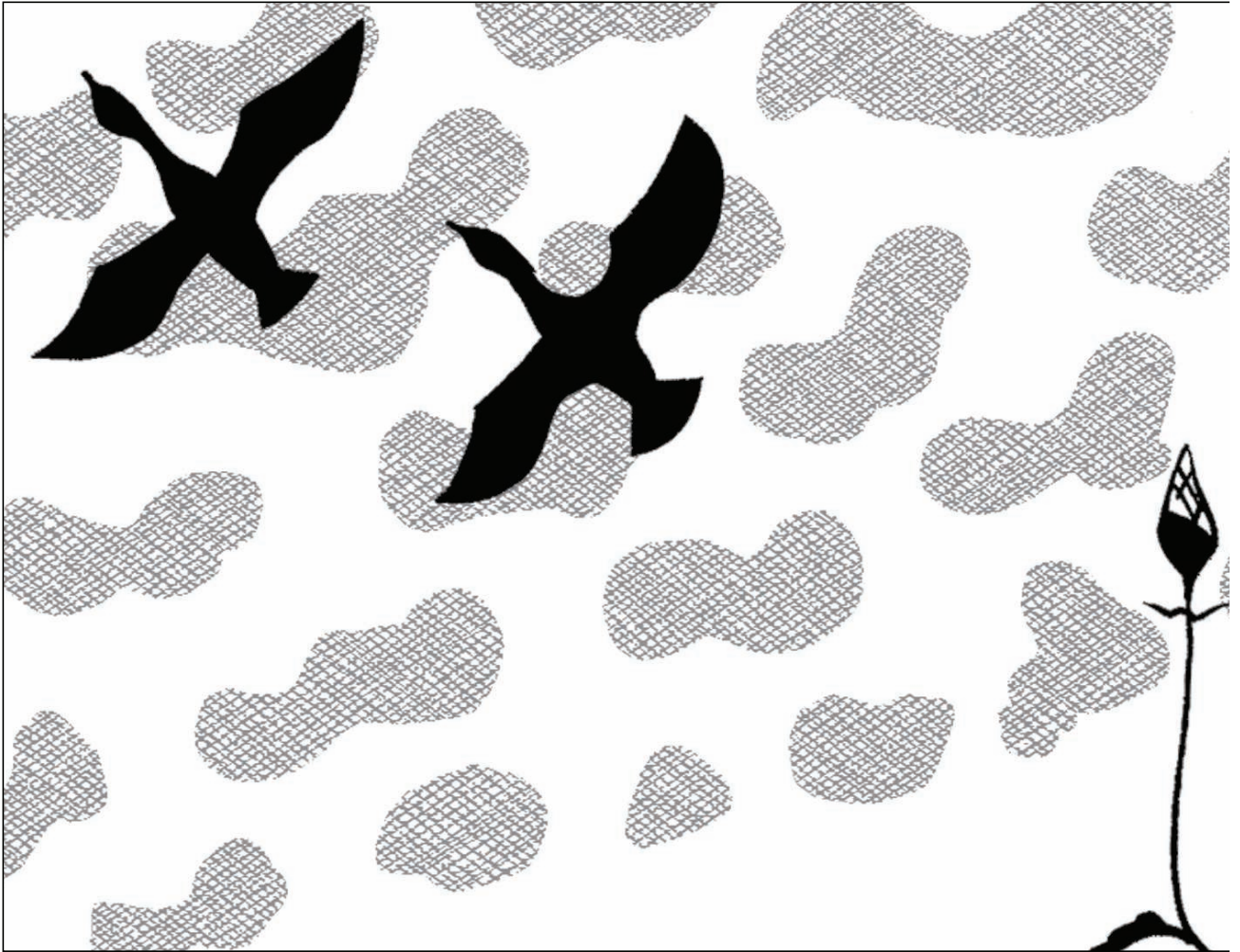
The Green Power Partnership is a voluntary program designed to support the increased use of green power among leading U.S. organizations in order to reduce the environmental impacts associated with fossil-fuel electricity use. Partners commit to purchase an amount of green power that is proportional to their annual electricity consumption. Eligible renewable resources include wind, solar, geothermal, qualifying biomass and low-impact hydropower. Participants that meet all criteria may seek certification and use the Green Power Partnership logo.

WasteWise is a voluntary program set up to help businesses, government agencies and nonprofit organizations save money by reducing their garbage. Organizations join the program for a three-year period and set goals in three areas: waste prevention, recyclables collection, and the purchase or manufacture of recycled products. WasteWise provides members access to online electronic reporting and valuable technical assistance. The program provides a framework for categorizing and quantifying solid waste and requires the establishment of waste reduction goals.

SmartWay helps companies assess and streamline their shipping operations so they can use less fuel and generate less pollution. SmartWay provides a comprehensive and well-recognized system for tracking, documenting and sharing information about fuel use and freight emissions across supply chains. It also helps companies identify and select more efficient freight carriers, transport modes, equipment, and operational strategies to improve supply chain sustainability and lower costs from goods movement.

For additional information on above and other EPA programs, visit www.epa.gov.





Paper | Chemistry

The number of global standards and regulations pertaining to harmful substances to humans and the environment in goods and packaging increases in scope and number every year. Suppliers must provide documentation of compliance with these regulations. Here are a few examples:

CPSIA | Child Protection, Safety and Information Act requires manufacturers and importers of products used by children 12 years and younger (including books and other printed matter) to meet mandatory U.S. Consumer Product Safety Commission safety standards relative to lead content. Certain printed children's products must also be tested and certified to meet the lead limits.⁶

CALIFORNIA AIR QUALITY 01350 | This specification establishes guidelines for indoor air quality. It was crafted to reduce exposure to harmful VOC emissions from building construction materials.⁷

LACEY ACT | It is unlawful to import, export, sell, acquire or purchase fish, wildlife or plants that are taken, possessed, transported or sold: 1) in violation of U.S. or Indian law, or 2) in interstate or foreign commerce involving any fish, wildlife, or plants taken possessed or sold in violation of State or foreign



law. In 2008, the Lacey Act was amended to include a wider variety of prohibited plants and plant products, including products made from illegally logged woods, for import.

REACH | Registration, Evaluation, Authorization and Restriction of Chemicals is a European regulation addressing the production and use of chemical substances and their potential impacts on human health and the environment. One major requirement of REACH is to communicate information on chemicals up and down the supply chain.⁸

ROHS | Restriction of Hazardous Substances, Directive 2002 / 95 / EC, is a regulation restricting the use of 10 hazardous chemicals in the manufacture of various types of electronic and electrical equipment.⁹

TOXICS IN PACKAGING (TCPH/CONEG) – Legislation in 19 states calling for the reduction of lead, mercury, cadmium and hexavalent chromium in packaging or packaging materials used or sold within the state. Manufacturers and suppliers are required to furnish a certificate of compliance to the purchasers of the packaging upon request. www.toxicsinpackaging.org.



Production

Sustainability involves considering every step in the process of getting a printed piece into the hands of end users and beyond. The first step is to consider options before printing actually begins that can be taken to minimize impacts from chemicals and paper waste.

OPTIMUM SHEET USE | Work closely with the printer early in the planning process to minimize paper waste. Parent sheets of paper typically come in several standard sizes. Designers can size their projects to make more efficient use of standard sheet sizes—printing two-, three-, or four-up (or more) to use less paper and to minimize the amount of waste. When making comps, designers can request the use of double-sided, smaller, reused or recycled paper.

SMALLER SAVES | Rethinking size in general is a good place to begin. Can a smaller piece serve the same purpose and have as much impact as a larger piece? Large or odd-sized designed pieces may not use paper efficiently and can result in substantial amounts of waste. Reducing size not only minimizes waste and energy consumption but also saves money.

BLEEDS | Bleeds can give design an increased impact; they can also impact the waste stream. Designs with bleeds are printed on oversized sheets and then trimmed to finish size. This not only increases the number of paper sheets but also increases the amount of trim waste. Consider downsizing to allow for trim on bleeds without upgrading to an oversized sheet of paper.

LESS COMPLEXITY EQUALS LESS WASTE | Simplifying a piece can also reduce waste. Complex folding specifications can use more paper, resulting in more waste. For example, while elegant, a french-folded book uses twice the paper necessary, as it is composed of sheets with printing on one side, folded to reveal the printed side only. Sometimes, reducing complexity might be as simple as adjusting the size of a pocket or folded section.

Evaluating your print design practices from an ecological standpoint can result in the added benefits of increased effectiveness and cost efficiency.

- * Would an alternative typeface or document layout increase legibility while decreasing page count?
- * Can the piece serve more than one purpose? Can a poster series be double-sided? Can a brochure double as a poster?
- * Can a mail promotion become a self-mailer?
- * Can specific content be omitted from a bound piece and inserted into a back pocket for a targeted audience?
- * For mailings, can the size, aspect ratio or weight be optimized for lower postage rates?

COMBINE JOBS | Ganging multiple print jobs uses less paper. By working with their printer early in the conceptual stage, designers creating multiple pieces with the same paper stock and ink can combine similar print jobs in the same print run. Ganged print runs reduce paper use, decrease the number of press make-readies, use fewer printing plates and save money.

DIGITAL PHOTOGRAPHY | The advent of digital cameras has drastically reduced waste output. Gone are the developing chemicals and the celluloid negatives. Paper is considerably reduced or eliminated entirely. However, not all digital photography is equal—care must be taken to ensure high resolution and quality.

DIGITAL PROOFING AND FILE DELIVERY | The electronic technology of the PDF (portable document format) can save not only resources but also time. Delivering art directly to the printer via PDF and/or server uploads eliminates wasted storage media. On-screen proofing, via PDF, eliminates paper and other wastes generated by the printing of a hard copy proof.

Inks

From a sustainability standpoint, there are several factors to consider when researching ink options. They include the effect of the printing process on the environment and the recyclability of the finished printed piece. The issues of volatile organic compounds (VOCs) that are emitted during the printing process, use of non-renewable resources and renewable resource content are important subjects to address. Designers may want to discuss ink options with their printer keeping these factors in mind. Cost is, of course, another important factor; any opportunity to reduce ink usage also saves money.



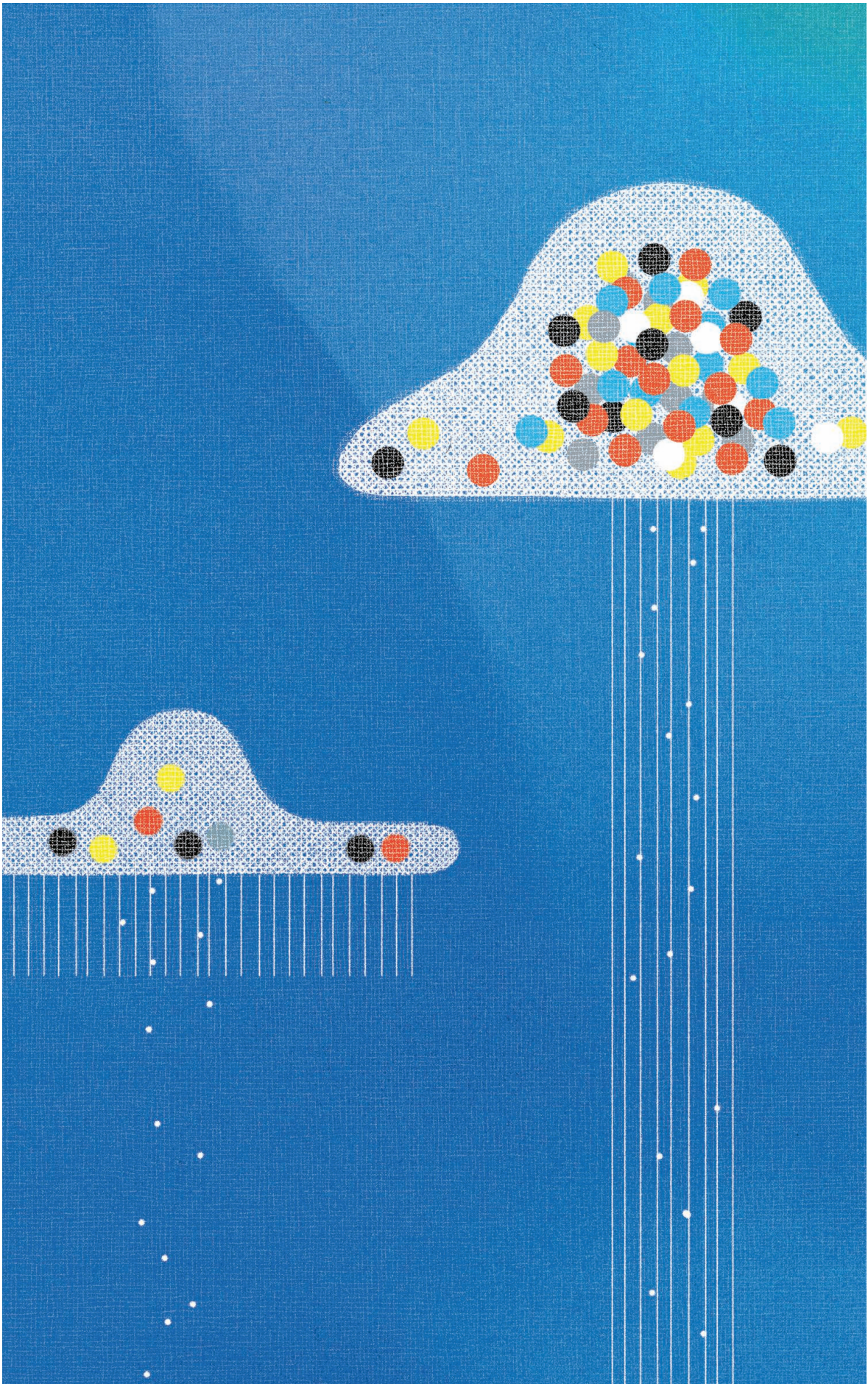
Consider using fewer ink colors, perhaps two instead of four. Four-color printing involves four metal printing plates and four separate inks. Attractive alternative designs can be made with effective use of spot colors. In addition, reduce full-page ink floods—more ink means more de-inking. De-inking is the process by which inks, adhesives, glues, staples and other non-paper elements are removed from recovered paper. De-inking raises some concern because the by-product is waste sludge that must be disposed of. Less ink has less of an impact on the environment.

VOC CONTENT | All inks contain some level of VOCs—even UV inks contain a minute amount. The higher the petroleum oil content in the ink, the higher the VOC levels. Historically, there was no real distinction between petroleum-based and vegetable oil or agricultural-based inks. The emergence of “vegetable oil based inks” is due to the replacement of all or part of a single component of the ink, which is the ink oil.

It is important to understand the role of the ink oil as it is a solvent that keeps the pigments, resins, drying oils and other additives in solution. Conventional petroleum-based inks have always contained renewable vegetable oils such as soy, linseed, cottonseed, tung or china wood oil and in most cases “vegetable based” inks contain some level of petroleum oil (the vegetable content may vary, typically from 7% to 100% with the remainder being petroleum).¹⁰

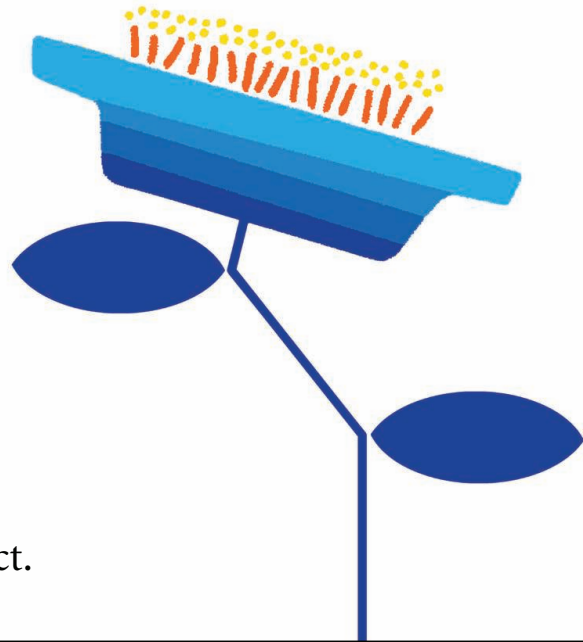
The lower the amount of petroleum in the ink the better it is for the environment—fewer VOCs are emitted into the atmosphere and there is lower consumption of nonrenewable resources.

VOC EMISSIONS | For lithographic inks, there is a distinct difference between VOC content and VOC emissions. Due to the nature of the petroleum ink oil used in inks, very little of the ink oil actually evaporates. For sheet fed and non-heatset web inks, the EPA recognizes that only 5% of the VOC in the ink is released to the atmosphere. For heatset web inks, 80% of the VOCs are evaporated in the dryer and are captured (with most of them being destroyed by an oxidizer). Since heatset inks dry by evaporation, the amount of vegetable oil that can be used is very low (5% – 7%) because the vegetable oils do not evaporate.



Printing

The printing industry has made great strides in developing and implementing products and processes that are friendlier to the environment. By collaborating with printers whose practices promote environmental sustainability, designers will be able to explore all the available environmentally sensitive options. Selecting the right printer and the right process will influence not only the quality and environmental impact but also the cost of a project.



LITHOGRAPHY (OFFSET PRINTING) | A process that takes advantage of the fact that oil (ink) and water (fountain solution) do not mix. The copy and art, or graphic content, is transferred to a planographic (flat) printing plate. During printing, ink and fountain solution (98% water) are applied to the plate, and the ink, which adheres to the image area, is then transferred to a rubber blanket before being printed on paper or other substrates. In recent years, the offset printing industry has shifted away from high-VOC-containing materials of the past to ones that have lower or no VOCs, which have less of an impact on the environment.

In order to reduce environmental impact, many printers are now using low-VOC inks (higher vegetable oil content) and coatings, and low-VOC water-miscible solvent blanket washes during press cleanup. Many wastes are either recycled or treated and disposed in a responsible manner. Some printing facilities have achieved a zero landfill status and do not throw away any wastes. Offset printing products are generally recyclable.

WATERLESS PRINTING | The waterless process uses the lithographic system with the elimination of the fountain solution, or dampening system. Instead of conventional metal, paper or plastic printing plates, this process uses a multilayered silicone-covered plate, and special ink is required for waterless printing. This process can provide high quality and efficiency with low dot gain for enhanced detail, better color saturation and faster make-readies. In the absence of a dampening system, waterless printing requires temperature controls for the ink rollers and more frequent cleaning of the blankets. The plate chemistry is solvent based and requires special handling, and the inks have a higher VOC content than the ones used in conventional lithography.

DIGITAL PRINTING | Digital printing can be accomplished through several different technologies that include ink jet (solvent-based, water-based, latex or UV cured), dry toner or electroink. Digital printing is often referred to as “print on demand.”

From an environmental perspective, each technology has its own advantages and disadvantages. Because all graphic content is in electronic form from creation through printing, the chemicals associated with plate making are eliminated, as is most make-ready waste. The digital process is flexible, allowing for small-quantity, on-demand print runs that reduce inflated inventories and ultimately reduce stockpiles of obsolete printed materials.

The environmental impacts will vary based on the process being used. Some digital technologies will emit VOCs, while others emit almost none. From a recyclability perspective, some are completely recyclable, while others are very difficult and the resulting pulps do not produce good-quality recycled paper.

COATINGS | Overprint coatings such as conventional varnish, water-based and UV-cured coatings are used to protect the printed work and may be used as design elements (using gloss or tinted coating—most often on coated stocks). Varnishes are printing inks without pigments and contain the same ink oil as inks do and can emit VOCs. Aqueous coatings are a mix of polymers and water, emit VOCs, do not require solvents for cleanup and can be recycled and repulped. As with inks, the less coating that is applied (with lower VOCs) to the sheet the less impact your project has on the environment.

UV INKS AND COATINGS | Touted for their beauty and durability, UV formulations are printed as a paste/liquid and immediately change to a solid film when exposed to ultraviolet light energy, releasing very low levels of VOCs into the air. This process involves special equipment such as UV lamps consuming energy, reflectors to intensify the light and cooling systems for the lamps, as well as special safety equipment and precautions for the press crews. This is an energy-intensive process. Although recyclability of UV-printed materials has been questioned, a study by the Beloit Corporation of Wisconsin has proven that paper printed with UV ink and coatings can be repulped, de-inked and recycled.¹¹ Generally, UV cured inks and coatings require more aggressive or higher-VOC-containing cleaning solvents.

OTHER PRINTING CONSIDERATIONS | Fountain solutions, used ink, emissions, chemistry and solvents used in the cleaning process can all have an impact on the environment. Eco-conscious printers will have a comprehensive program for addressing these aspects of their operations.



Finishing

Designers who have taken the initiative to choose environmentally sustainable paper, low-VOC ink and a design that minimizes paper waste will want to be sure that all their efforts are not wasted through finishing techniques that hamper the ability of their projects to be recycled.

SADDLE STITCHING | Metal wire that is used in binding does not need to be removed for recycling in most municipalities. The wire is removed at the recycling pulp mill using magnets, screens and filters during the repulping process. Although the wire is not itself recyclable, this is still a good option.

PERFECT-BOUND ADHESIVES | In order for perfect binding to be recyclable, all adhesive residues must be removed from the paper fiber. Hot-melt, petroleum-based glues are hard to remove during de-inking. Water-based, non-chlorinated glues, however, break down easily during the recycling process.

WIRE SPIRALS AND PLASTIC COMBS | These are recyclable as long as they are separated from the printed pieces. Consider including a note to end users on the printed piece with instructions on how to recycle.

EMBOSSING | Using no chemicals or inks, this technique of creating a raised or receding image is an environmentally benign way to add dimension. The die can be reused and it works beautifully on uncoated paper.

DIECUTTING | In this method, the die acts like a cookie cutter. Similar to embossing, there is no use of chemicals or inks, and the die can be reused. This is another environmentally benign way to achieve a dramatic effect that works well on uncoated paper.

ENGRAVING | The complicated engraving process involves etching designs into dies, inking the dies and pressing the die to paper. This classic and typically costly technique imparts elegance with minimal environmental impact, as most engraving inks are water or vegetable based.

FOIL STAMPING | Foils are polyester film coatings that impart a polished look with a wide variety of finishes. Transfer metallization is another method of adding metallic and holographic finishes without the need for films.

Packaging

This category is broad and includes on-garment identification, product labeling, containers and carrier bags. Packaging needs to protect the integrity of the product while representing the brand and product. According to the Center for Sustainable Systems, University of Michigan, packaging and containers amount to 30% of the municipal waste stream.¹² As a result, designing packaging with the environment in mind can dramatically impact energy use and the waste stream overall.

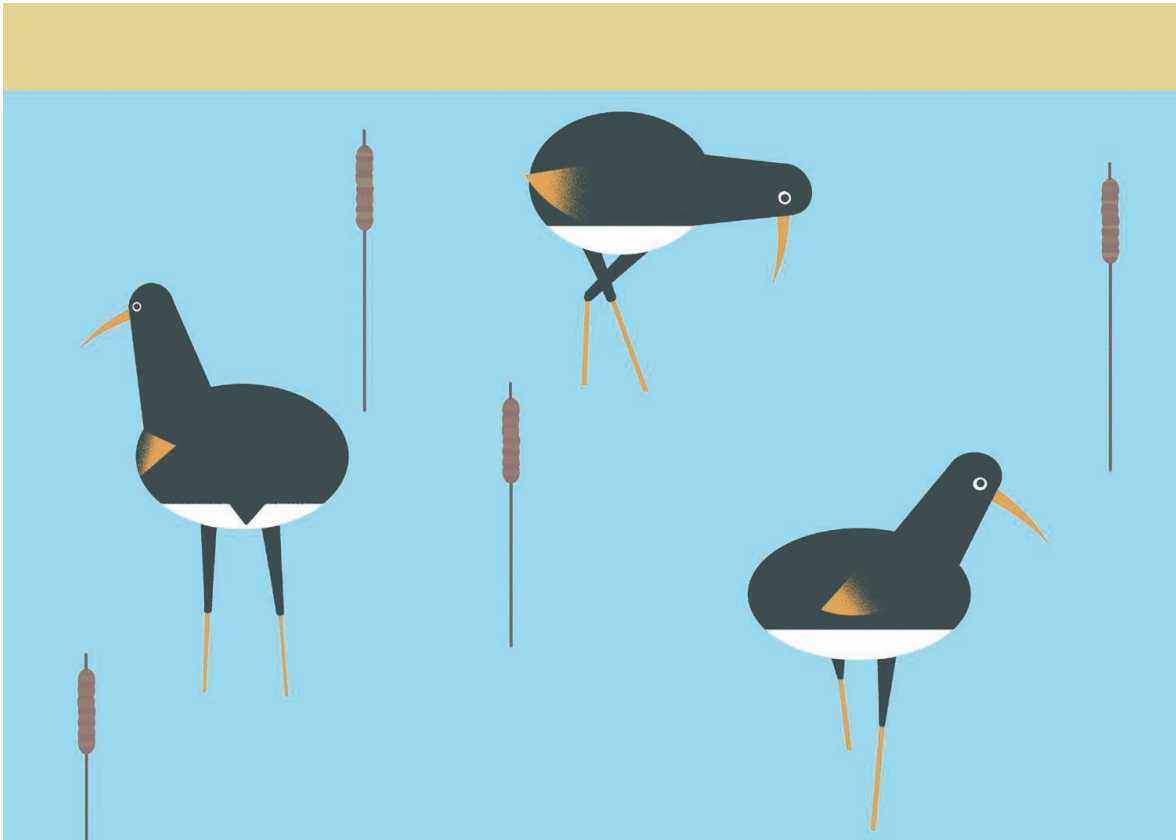
ECO-SIZE IT | Designers intent on pursuing eco-friendly packaging options need to look first at the attribute that can have the most immediate impact: size. While oversized packaging once was considered to be a good way to gain more visibility on the shelf, today's eco-oriented consumers see oversized and overpacked items to be wasteful.

Amazon.com sends a “Rate Our Packaging” survey after shipping its goods to understand perceptions about its packaging practices.

DESIGN IT TO LAST | Although it might seem a bit counterintuitive, another way to make packaging eco-friendly is to design it to last. Packages themselves can become keepsakes if they are attractive and durable enough to provide an alternative use. Similarly, packaging for non-perishable products can be designed to be an appealing and efficient storage method for product throughout its useful life. Packaging longevity can also be encouraged by building convenience features into the package design. Features such as hanging tabs for easy storage, contours that aid in stacking and inserts that provide a base for more unsteady products can all add to a package's lifespan.

PAPER OR PLASTIC? | The choice of materials can greatly influence the impact of print, packaging and environmental graphics on the environment. Choosing packaging components that are made from recycled materials is a good way to start. Materials also need to be considered in terms of the amount of energy required to create them and the amount of waste and pollution created during their manufacture. Other considerations include a material's level of biodegradability and how easily and likely it is to be recycled. Last but not least is whether or not a material is made from renewable resources.





Environmental Graphics and Signage

A significant portion of environmental graphics and signage is printed on plastic, vinyl and styrene. The overall availability of recycling options for these plastics lags far behind that of paper. Most curbside plastics recyclers will not take rigid polystyrene. Improper combustion of polystyrene may be harmful to health and the environment. Innovative, high-performance, fiber-based substrates offer healthier options.

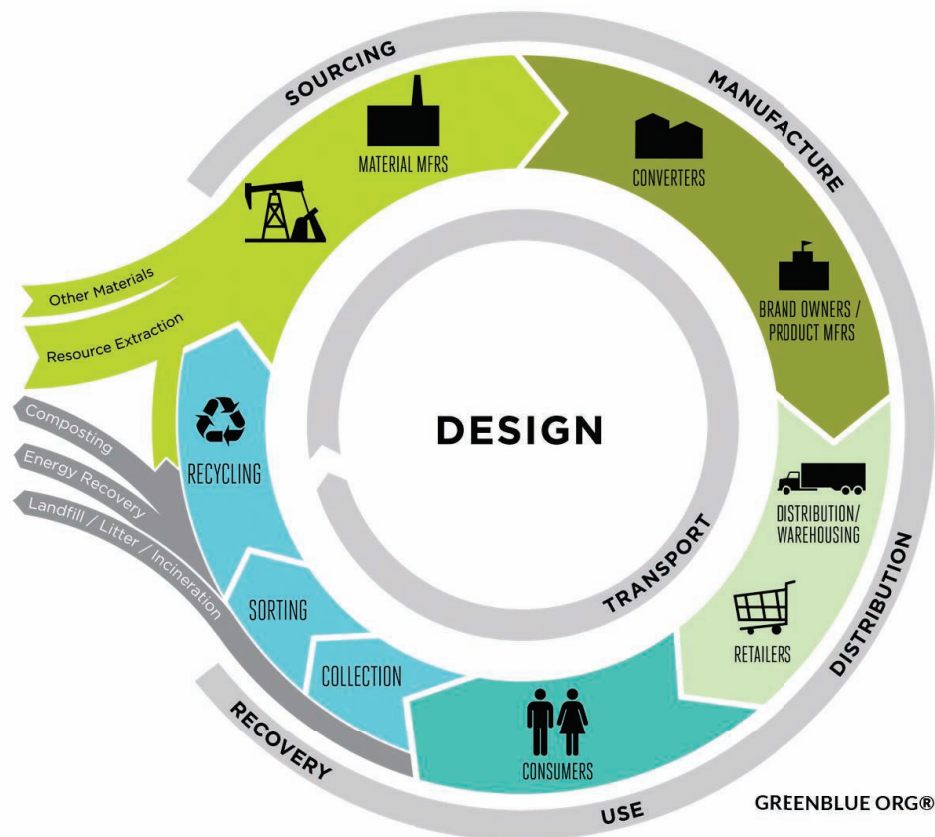
The United States Green Building Council (USGBC) Leadership in Energy and Environmental Design (LEED) standard is changing the way we think about how buildings and communities are planned, constructed, maintained and operated. The certification program awards points for avoiding certain materials because of their environmental impacts.

Paper alternatives meet stringent air quality standards for commercial spaces (no/low VOCs) and many are recyclable. For those that are not recyclable, they may be safely incinerated and will break down if landfilled.

WASTE / RECOVERY

Perhaps this section should have appeared at the very beginning of this Field Guide. There are enduring and often unintended consequences from decisions made in design and production stages of product and packaging development. Some very good examples would be styrene backlit posters, plastic water bottles and those single-serve coffee brew cups that present a tremendous strain on residential and municipal waste streams. Thinking about design holistically, with consideration for end of life, will yield the most sustainable solution. This is the concept that is embodied in the circular economy that has emerged as a significant trend in sustainability.

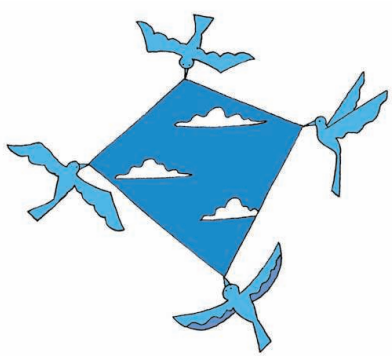
Embarking on a Zero Waste to Landfill goal is a daunting but achievable exercise. Today, there are many resources available to companies to manage the many types of waste generated in the normal course of business. Work with local waste management companies to help analyze your waste and help identify reclamation, recycle, upcycle or waste-to-energy opportunities. Waste is now a valuable commodity.



Graphic taken from: sustainablepackdesign.com

How to Say It

Consumers want transparency and they reward authentic brands with their business. When a brand openly shares the commitment that has been made to reduce its environmental and social impacts, the consumer becomes connected and a brand evangelist is born.



A recent report from Nielsen illustrates that for more than half of consumers (62%), brand trust is important in their buying process.¹³ Brands have a real opportunity to increase trust and develop relationships with consumers by demonstrating their commitment to sustainability.

There is quantifiable business and reputational risk when a company is not engaged in corporate social responsibility.

Articulating sustainable practices must pass Federal Trade Commission (FTC) muster as well as the consumer sniff test. Adhering to the Green Guides will mitigate reputational risk when sharing the sustainability journey—be it on a website, in stores, in promotions and on products. Avoid the sins of greenwashing at all cost—it can make or break a brand. Don't end up on the wrong side of greenwashingindex.com.

According to ecolabelindex.com, there are over 465 third-party ecolabels. It is becoming increasingly difficult to keep up with all of the new standards and labels. A good supplier will help to sort it out.

BE SPECIFIC | An environmental claim needs to be clear whether it relates to the product, the package or a service. A general statement on a package containing a product that simply states “recycled” can cause confusion over whether the claim relates to the package itself or the contents of the package. When in doubt—spell it out. Also, avoid general implied environmental benefits such as “Earth-Safe” or “Environmentally Friendly” without clear qualifying language that limits the claim to specific product attributes that can be substantiated.

DON'T OVERSTATE | Avoid making claims that overstate or imply environmental benefits when they are in reality negligible. A claim of “50% more recycled content than before” would be an obvious overstatement if the product went from 1% to 2% recycled content for example. It is better to assess the worthiness of a claim based on the significance of the total environmental impact, not on overstated or exaggerated percentages.

CLAIMS MORE OR LESS | When making comparison claims, it's important to ask the question—compared to what? Is it being compared to the marketer's prior offering, a competitor's or an alternative technology? A claim of “Produces 40% fewer emissions” is deceptive on its own as it needs to spell out the basis of the comparison. “Produces 40% fewer emissions than our prior product” would be more acceptable provided the benefit is significant, isn't overstated (see above) and can be substantiated.

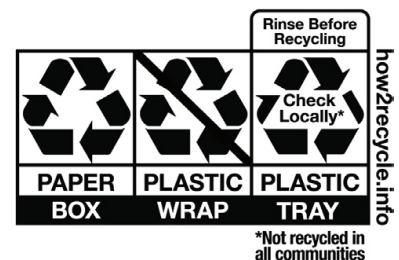
AVOID SMOKESCREEN CLAIMS | Smokescreen claims are those that select one environmentally preferable component or process that goes into a product to make or imply the “eco-case” for the entire product, disregarding harmful components or processes that are also inherent in the product. Using the claim of “Petroleum-free” for a paint that is lead-based would be an example of a smokescreen claim.

SUBSTANTIATE, SUBSTANTIATE, SUBSTANTIATE | The basis and legitimacy of any claim, environmental or otherwise, depends on substantiation of its true impact, and that substantiation needs to be in the form of measurable provable, and accurate data.

HOW2RECYCLE.INFO

How2Recycle is a standardized labeling system that clearly communicates recycling instructions to the public. It involves a coalition of forward-thinking brands who want their packaging to be recycled and are empowering consumers through smart packaging labels.

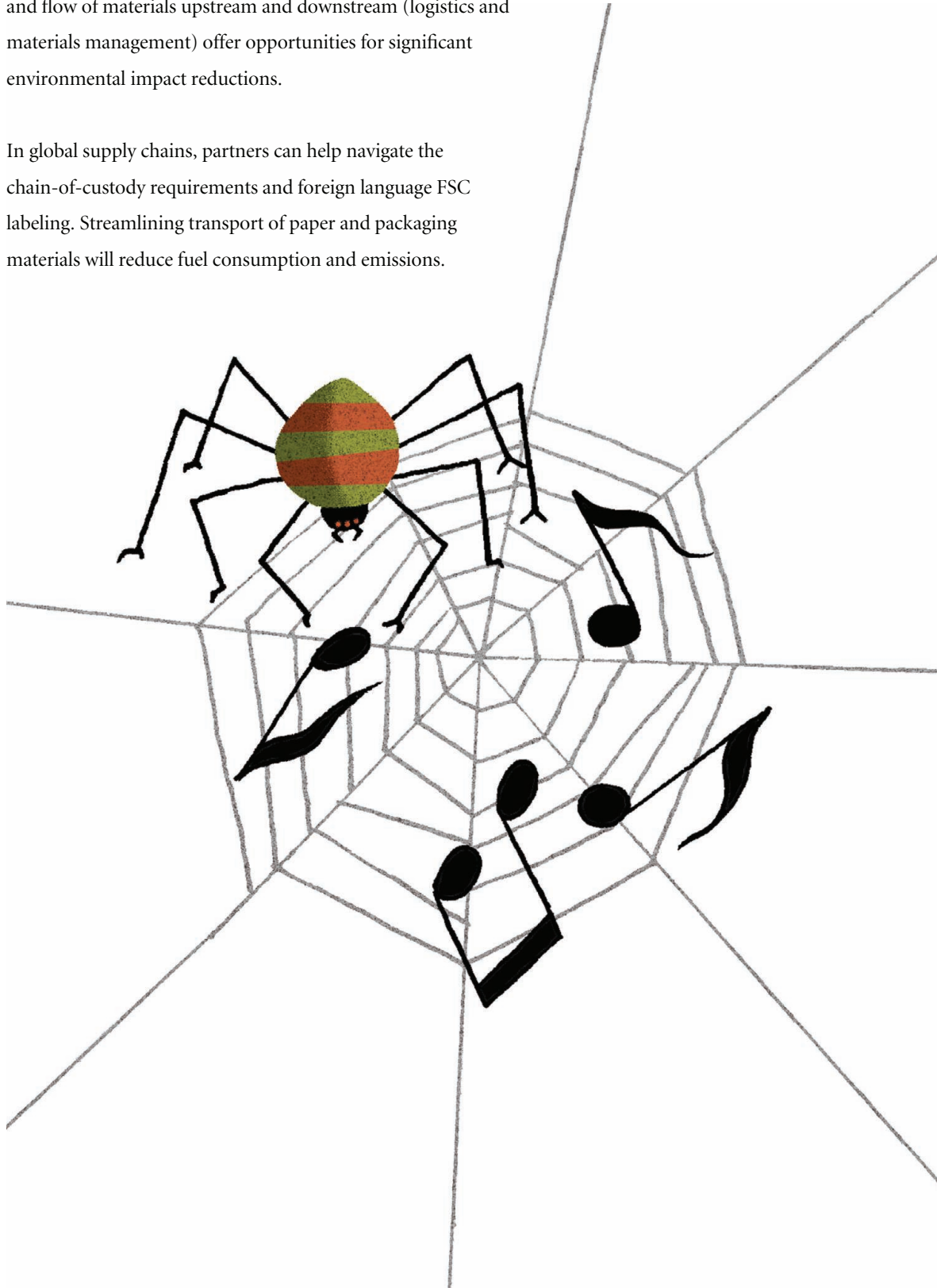
A printed piece or package can be labeled as recyclable only if it can be recovered from the solid waste stream for reuse through an established recycling program.



Supply Chain

Develop a supply chain of environmental excellence. Choose partners that understand your business. Improving specification and flow of materials upstream and downstream (logistics and materials management) offer opportunities for significant environmental impact reductions.

In global supply chains, partners can help navigate the chain-of-custody requirements and foreign language FSC labeling. Streamlining transport of paper and packaging materials will reduce fuel consumption and emissions.





Paper or Plastic

This isn't just a question for the grocery store. In many cases plastic, a non-renewable petroleum-based resource, is over-engineered for its intended use. There are excellent opportunities to replace plastic, PVC, styrene, vinyl and OPP films with renewable fiber-based alternatives.

Backlit and Front Lit Displays

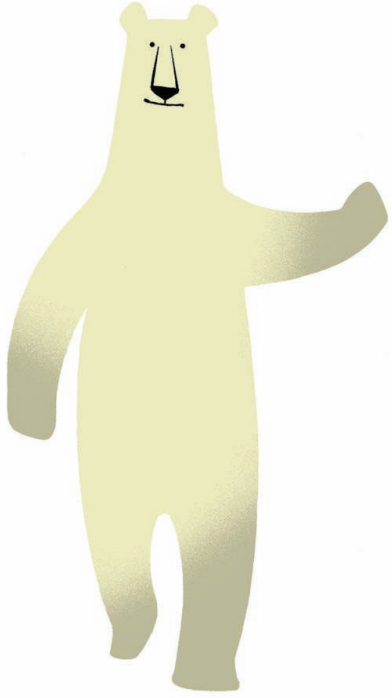
Boxes and Bags

Environmental Graphics

Garment ID - Tags and Tickets

Gift and Loyalty Cards

Wallgraphics



Business Case for Sustainability

According to Mark W. MeElroy, Ph.D., in an article published in Sustainable Brands, “reputations reside in the minds of observers,” and authentically sustainable companies are financially rewarded because of their reputation as good corporate and environmental citizens. That is called “the sustainability effect.”¹⁴

Understanding environmental and social aspects and managing impacts are necessary to protect an organization from financial, compliance and reputational risk. Key areas of focus should be: energy and carbon management, water management, materials and waste management, human rights and supply chain.

Believe it or not, choosing the right paper and packaging suppliers will help mitigate some of these important risk factors and contribute to sustainability goals.

HEALTH AND WELLBEING | If a company operates in a responsible way by conserving natural resources, providing a healthy work environment and treating its workforce with respect, it will reflect in employees’ attitudes and the products they produce. According to Eileen McNeely of the Harvard School of Public Health, there is a direct correlation between employee wellbeing and a “thriving, sustainable organization.”¹⁵

MATERIALITY

Environmental, Social and Governance (ESG) | Establishing standard corporate responsibility metrics will ensure that CSR becomes embedded into the fabric of the overall business strategy. In KPMG’s “Currents of Change” survey of Corporate Responsibility Reporting 2015, here are the essential elements of a CSR Report:¹⁶

1. **Stakeholder engagement**
2. **Materiality**
3. **Risk, opportunity and strategy**
4. **Targets and indicators**
5. **Transparency and balance**
6. **Suppliers and value chain**
7. **Corporate responsibility governance**

When it comes time to communicate CSR practices in print, walk the talk by referring to the valuable information provided in this Field Guide.

“ In the long term, the economy and the environment are the same thing. If it’s unenvironmental, it is uneconomical. That is the rule of nature.”

~ MOLLIE BEATTIE

American Conservationist







About Monadnock

Monadnock is a family-owned and -operated business with nearly 200 years of experience in papermaking.

Today, Monadnock is a strong company and is dedicated to corporate social responsibility. We will continue to challenge ourselves to reduce our environmental impacts, substitute materials, reduce demand on natural resources and reuse whatever we can while providing a safe and healthy place to live and work—not only for this generation but for future generations.

This is how we define sustainability.

THE ARTIST |

YENPITSU NEMOTO

Yenpitsu Nemoto studied the Arts at Nihon University from 1972 to 1976 and taught there from 2004 to 2010. His illustrations have been used in publishing, advertising and many other mediums. You will find his work on the covers of books, magazines and promotional papers, posters, websites and more. He was a member of Society of Illustrators New York until 2005 and currently is a member of Tokyo Illustrators Society. Virgo. Type A blood.

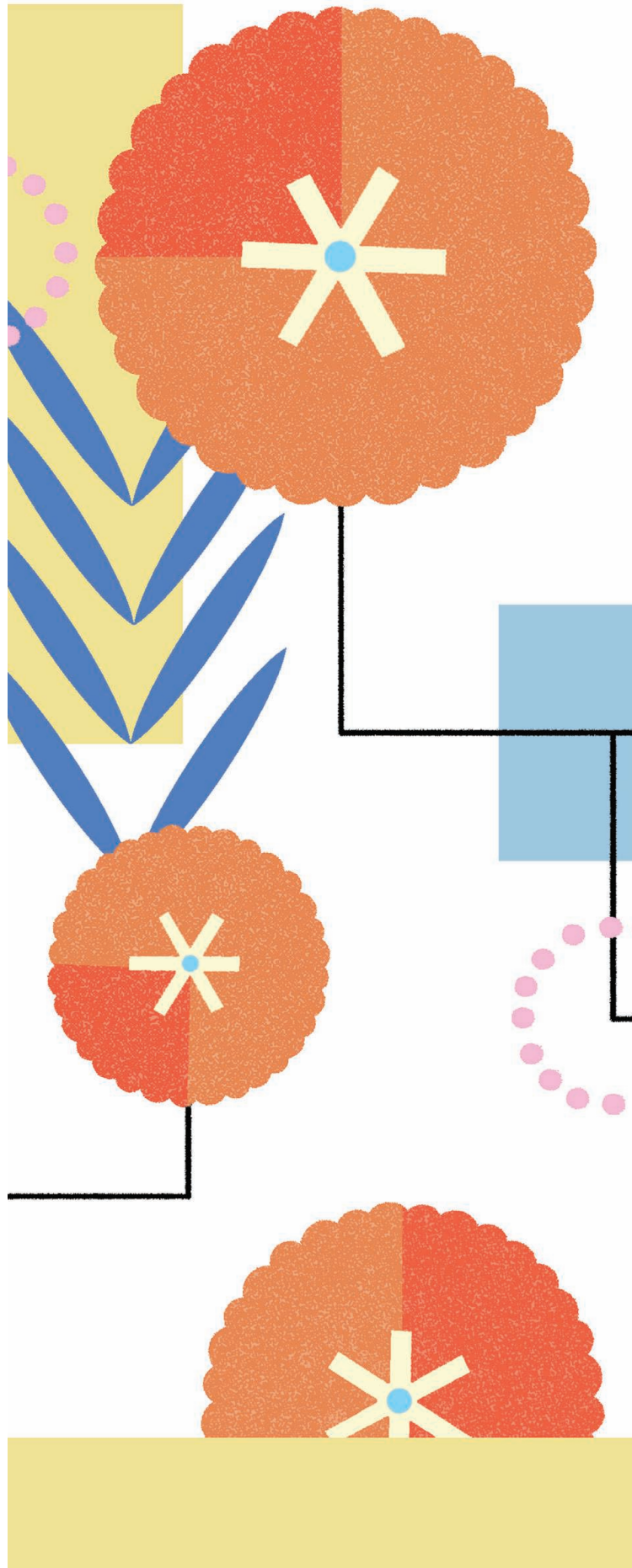
Yenpitsu on his work: The elements of the visuals which I create are not founded on actual things. The flowers are not from actual flowers, the man is not from actual man, for example. I always try to make a “whole visual” designed well. The elements compose the whole visual composition. The theme makes elements, shapes and colors make comfortable composition. I like good design, that’s all.

DESIGN

Blossom Creative

SPECIAL THANKS

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Disclaimer: Information for this brochure was obtained from the best sources available at the time of printing.

“I will act as if
what I do
makes a
difference.”

~ WILLIAM JAMES

American Philosopher and Psychologist



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