

Xerox guides customers to print responsibly. Helping to meet the challenge of sustainable printing.

Contents

Introduction	2
Print's environment impact	3
The green office	4
Green office practices	5
Reducing paper usage	6
Reducing and controlling waste	7
Green purchase decisions	8
Green production	9
Paper, ink and equipment	10
Green production facilities	11
Leading customers to green	12
Looking ahead	17



Introduction

Awareness of environmental sustainability is pervasive today. Enterprises encounter it at every turn—in legal requirements, customer demand, management policy, grassroots employee initiatives, and health and safety concerns for employees, the local community and future generations.

Its influence continues to grow. More than four out of five organizations purchased greener information technology products in 2009, up from about one in two in 2008.¹ Four in five decision makers now believe environmental stewardship is a business responsibility.¹

Their commitments are buoyed by the business benefits green initiatives can deliver. In some cases, they can reduce operating costs, help to provide market differentiation and qualify the firm for the increasing number of requests for proposals that require green capabilities for consideration.

Yet some of the strongest green commitments are based on personal commitments “to do what’s right” for employees, the community and the world.

Even for these leaders, however, sustainability decisions are part of a broader decision-making process that also considers costs, customer demands, competitive pressures and other factors. The green programs that have the best chance for adoption are those that best fit the enterprise’s multidimensional circumstances.

Sustainability initiatives run a wide gamut. They can be as simple as paper recycling. And they can be as complex as calculating the business’s carbon footprint, accounting for a tangled web of factors extending to the number of trees cut down to create the field where the soy was cultivated for the soy-based inks used to print your annual report!

As a decades-long leader in environmental sustainability, recognized for its commitment to sustainable growth, Xerox is dedicated to helping its customers make sense of this tangled web to print responsibly—to optimize the value of every printed piece, while minimizing waste and energy usage throughout the print life cycle.

This white paper serves to document the ways Xerox helps its customers to print responsibly.

Print's environmental impact

Sustainability efforts are necessary in office and production environments because printing has associated environmental impacts—as do most industrial processes. While the purpose of this white paper is not to document these effects, the following brief description of the leading concerns provides necessary context.

According to a 2009 study by PRIMIR (the Print Industries Market Information and Research Organization), printing's greatest impact on the environment is from paper—both the production of paper and the waste generated in printing. PRIMIR reports that the paper industry:

- Is the fourth largest emitter of greenhouse gases among U.S. manufacturing industries
- Contributes 9 percent of total carbon dioxide emissions from manufacturing
- Is the second largest user of electricity in the United States, at 75 billion kilowatt-hours in 2006

Waste inflates paper production volumes, exacerbating the problem. Other environmental impacts of printing—including toxic inks, cleaning agents and machine parts, air pollutants, electrical usage, and non-paper waste—are also serious, but fall far short of paper's environmental impact.

Yet even the impact of paper must be put into context, for electronic alternatives also have a significant environmental footprint. Data centers and servers used 61 billion kilowatt-hours in 2006, a figure that is projected to double in five years.² So data centers will soon overtake paper production in electricity usage, if they haven't already.

Consider also that paper is made from a sustainable resource—trees. The annual net growth of U.S. forests is 36 percent higher than the annual volume of tree removals, and U.S. forest acreage is about the same as it was 100 years ago, 750 million acres.³ Further, more than half of U.S. paper is recycled, according to the U.S. Environmental Protection Agency (EPA). In comparison, only about 18 percent of televisions and computers and 10 percent of cell phones were collected for recycling at end of life in 2007.⁴ All of these electronic products contain toxic heavy metals that can adversely affect the environment.

So, determining the most environmentally responsible processes is not cut and dried. As noted earlier, industrial processes have environmental consequences, and people can choose to participate in them in more—or less—environmentally responsible ways. For its part, Xerox is dedicated to enabling leadership environmental stewardship in both office and production environments.

The green office

Among the multidimensional considerations that go into green decisions in office environments, cost is nearly always a prime motivator. Only the most committed companies (3 percent) give environmental issues a priority even when they increase costs.¹ And cost difference between green and non-green technologies is the number one reason why companies compromise their green intentions.¹

An increasingly common approach is to optimize the “triple bottom line” of financials, environmental sustainability and social areas that affect employee satisfaction, safety and comfort. Factors that can place greater weight on green programs include market differentiation strategies based upon environmental sustainability and positioning as a concerned and responsible community citizen.

Many environmentally responsible practices play well to a balanced triple bottom line. These include green processes, such as reducing power consumption, waste and paper usage, and green purchase decisions and strategies, which can lessen power usage and waste while enabling additional green processes.

Early adopters of green policies include:

Leadership green enterprises. These are organizations in nearly any industry for which being green is a core value and a key quality of its brand and reputation. Evidence of leadership can include use of Leadership in Energy and Environmental Design (LEED) guidelines for green building design, having a green policy and dedicated staff, and location in a community—or participation in an organization—with a public commitment to sustainability goals.

State and local governments. Sustainability is one reason that local and state governments exist. They are charged with preserving, protecting and restoring many of their communities’ natural resources and have direct responsibility for many environmental policies and programs. Many promote a shared sense of responsible stewardship for the environment and serve as role models, optimizing sustainability in all of their activities, including their offices.

Primary education. For K-12 school systems, teaching sustainability—both in the classroom and by example—is part of the mission of educating the next generation. Environmental issues are an integral part of the curriculum and a critical concern in operations. Many schools seek to lead their communities in adoption of green practices. Sustainable alternatives are usually looked upon favorably in most decisions, including office systems acquisitions.

Higher education. Colleges and universities seek to show intellectual leadership in their academic and local communities. Some also have academic competencies in the environmental sustainability field. In recent years, many institutions have made high-visibility commitments to establish climate-neutral campuses through the American College and University Presidents Climate Commitment Program. Some 675 schools have signed its climate-neutral pledge.

Document-intensive industries. Companies in document-intensive industries have heightened motivations to better manage their print volumes. In particular, those in financial services, insurance, healthcare and energy utilities tend to embrace green practices. They generally have resources to invest, high community profiles to bolster, and a need to compete by innovating. Green practices play well in each of these areas. And within these and other enterprises, information technology officers tend to be advocates of environmental sustainability. A key reason is the overlapping objectives of environmental benefit and cost reduction.⁵

Green office practices

Viewed through the prism of the three Rs—reduce, reuse and recycle—“reduce” tends to get top billing in sustainability programs geared to network printing and multifunctional devices. That’s because reduction efforts usually cut costs, making them easy to justify and, for many, imperatives to pursue.

The leading initiatives in office environments are around reducing usage of power and paper and cutting waste.

Reducing power usage

By a margin of more than two to one, the leading quality that makes a printer or multifunctional device greener in the eyes of decision makers is increased energy efficiency.¹ Not surprisingly, then, the three top green equipment-acquisition strategies all involve energy saving.² They are, in rank order:

Buying ENERGY STAR® and eco-label certified devices. These are designated as the most energy-efficient products in their respective categories by the ENERGY STAR program, which is administered jointly by the U.S. Environmental Protection Agency and the U.S. Department of Energy. Two-thirds of organizations seek ENERGY STAR devices or plan to seek them in the next 12 months.¹ Demand for ENERGY STAR-compliant products is independent of the buying company’s views of climate change, suggesting that the program has considerable influence.⁵ Xerox offers a full complement of ENERGY STAR-compliant products.

Replacing printers, copiers and fax machines with fewer multifunctional devices.

The typical office network has grown ad hoc, resulting in underutilized assets, inefficient energy consumption and maintenance, and unnecessary waste. Recognizing this, more than 40 percent of companies are seeking to reduce the ratio of hard-copy devices to employees.⁶ Consolidating on fewer, ENERGY STAR-compliant devices can reduce energy consumption by as much as 50 percent. Optimization strategies can also reduce consumables and associated waste, as well as floor space and storage requirements, while boosting productivity and easing device management to further cut costs. Xerox offers an array of tools to help in evaluating the carbon footprint implications of office optimization strategies.

Using intelligent software to manage energy use. Smart technology can power down office devices during off-peak times when usage is low and track actual device usage patterns to help manage power consumption more efficiently. Alternatively, users can power down equipment when not in use. Seventy-six percent of office professionals report turning off personal electronic equipment each day.⁵ Intelligent power-down software is standard on many Xerox® devices.

Reducing paper usage

Reducing the number of pages printed is the leading way enterprises seek to reduce environmental impact.⁷ The financial motivation is clear, and the conservation issue is just as compelling. If every worker generated just five fewer pages per year, 21 million trees would be saved.⁸

One perspective on the problem comes from a Xerox work practices study, which found that office workers discard 25 percent of everything they print by the end of the day. Observations like this lead many organizations to not just focus on quantity reduction but on leading staff to print the right pieces at the right time and in the right way.

For example, larger volumes that aren't needed immediately can be printed more cost-effectively at centralized facilities. However, in establishing more environmentally responsible practices, states Gartner, Inc., "The behavioral component is probably the most important one."⁹ That's why many firms seek to automate as much as possible their processes for reducing printed pages. Here's how enterprises are doing it:

Default two-sided (duplex) printing. More than half of U.S. organizations encourage two-sided printing or plan to in the next 12 months.¹ Some companies encourage this by making duplex printing the default setting in the end-user's print dialog box for ordering print jobs. The Xerox® Earth Smart print driver, for example provides settings that enable users to establish defaults for duplex printing and other more environmentally friendly print settings, to use less toner. About 14 percent of enterprises employ green print drivers.¹

Content management software. Thirty-six percent of organizations use or plan to use content management software to reduce the need to print by scanning and storing documents electronically for printing on demand.¹ These processes move more paper into digital formats, saving time and print costs and, in some cases, complying with government regulations. Xerox offers an award-winning enterprise content management solution, Xerox® DocuShare®, which enables staff, partners and customers to electronically create, review, approve, distribute and archive documents over the web. In addition, Xerox® multifunction devices and software are designed for scanning documents to desktops or central repositories, enabling a streamlined process for digitally archiving documents and better controlling print volumes. And Xerox® Smartsend® software enables document capture, conversion and routing for quick, easy and secure sharing of hard-copy information to support most every work process.

Print management software. To better manage print, one-third of enterprises use enterprise print tracking and usage tools, and 22 percent use print infrastructure planning and asset management tools.¹ Among Xerox® offerings in this category is GreenPrint software, which automatically detects unwanted pages in a print file, such as header pages, and gives the user an opportunity to eliminate them from the print job. Another is rules-based printing, which can guide users to the available print devices offering the lowest costs and required features, such as two-sided printing to control paper usage.

Pull printing. This feature enables users to release their jobs for printing from the printer's user interface, helping to reduce unwanted pages being left in output trays. Xerox provides the capability with its Xerox Secure Access Unified ID System®. Users send a document to a secure server for printing only when the user swipes the appropriate ID badge at the device.

Reducing and controlling waste

Despite all the emphasis on reducing costs, the overall leading print-focused green behavior is recycling toner cartridges and ink bottles, which is largely cost neutral, though it can reduce waste removal costs. Some 72 percent of organizations follow this practice or plan to within the next 12 months.¹

In some cases, however, economic advantage is found by purchasing recycled and remanufactured goods. And 43 percent use paper that is recycled or has its chain of custody certified as environmentally sustainable at a cost that is the same as or slightly more expensive than standard paper.¹

Here are some of the most popular ways enterprises are controlling their waste:

Paper recycling. This practice is widespread in enterprises of all sizes. As noted above, more than half of the paper produced in the U.S. each year gets recycled, according to the EPA.

Cartridge-free, solid ink. Xerox offers an exclusive cartridge-free, solid-ink print technology that in its latest iteration—the ColorQube™ series—produces 90 percent less waste over a four-year lifespan than comparable laser printers. The nontoxic solid ink sticks have no plastic cartridges or casings that need to be discarded or recycled when they're depleted. To use them, they are simply dropped into the machine. The technology enables a simplified printing process as well—ink sticks are melted and the image transferred in a single pass—that requires fewer supply items than comparable laser printing, making them easier to maintain. Where comparable lasers have about 10 service components that need to be replaced periodically—including imaging units, fusers and waste toner bottles—many solid-ink components are designed to last for the life of the machine. ColorQube has only one replaceable unit, a cleaning unit, which gets replaced once or twice a year. Further, a 2009 Xerox study conducted by Xerox and peer reviewed by the Rochester Institute of Technology comparing ColorQube to a comparable laser printer found that over the product life cycle, the solid ink multifunction printer studied exhibited 9 percent lower life-cycle cumulative energy demand and 10 percent lower global warming potential than the laser multifunction printer. The net-net is that solid ink uses less energy and materials over the life cycle and produces less waste in the office than comparable laser technology.

Take-back and recycling programs. Many manufacturers help their customers manage equipment and supplies at end of life by offering convenient take-back and recycling programs. The Xerox Green World Alliance supplies return program, for example, provides prepaid postage labels and packaging from new supplies for returning spent materials to Xerox for recycling. The Xerox worldwide equipment take-back and reuse/recycle program achieved a 98 percent recycle rate in 2008, and since their inception, these programs have diverted more than 2.2 billion pounds of waste from landfill.

Green purchase decisions

More than half of U.S. enterprises have or are considering initiating an environmentally responsible purchasing policy.¹ Mandated green buying—mostly targeting consumables and supplies—is included in about one-third of those. These programs address the enterprise’s environmental concerns as stated above, and some take additional factors into account, such as the following:

Green manufacturing processes. Part of the equation for determining environmental impact of various equipment is the carbon footprint of the manufacturing and distribution processes. Xerox’s world-class manufacturing operations are all ISO 14001 certified and demonstrate continuous improvement on the environmental front. Among the industry’s more energy-efficient manufacturing processes is production of Xerox® Emulsion Aggregation (EA) Toner. EA Toner is grown chemically into smaller, more uniform particles than conventional toner, which is produced in a grinding process. Because of the differences in manufacturing process and toner properties, EA toner enables approximately 20 percent lower system energy per page (from manufacturing through use) than conventional toner. And the quality is excellent, suitable for use in the graphic arts.

Greener paper choices. As mentioned above, 43 percent of enterprises use paper that is recycled or has its chain of custody certified as environmentally sustainable. Xerox is among the leaders in this regard. All Xerox® papers are sourced from companies committed to sound environmental, health and safety practices and sustainable forest management. In addition, Xerox offers papers certified to sustainable forest management standards by the Forest Stewardship Council (FSC) and the Programme for the Endorsement of Forest Certification (PEFC), as well as recycled paper containing post-consumer waste ranging from 10 percent to 100 percent. Xerox rigorously tests and qualifies its papers to run well on Xerox® equipment.

Green reputation. Nearly 60 percent of decision makers base green IT hardware purchase evaluations exclusively on product-level environmental characteristics. However, most green-minded companies (53 percent) make final purchase decisions only after screening vendors’ environmental records. And nearly 20 percent claim they look only at the vendors’ overall record when buying green products, not at specific product features.¹

Green production

While production shops share many of the same environmental concerns as office environments, they differ in some fundamental ways.

These shops include production operations within the enterprise (in-plants) and the many types of commercial printers. They operate on a larger, industrial scale, more like a manufacturing facility than an office, so the environmental challenges associated with printing are commensurately greater. Further, production plants produce printed pieces as final products for customers, so achieving customer satisfaction with printed pieces—and, in some cases, the sustainability of the production processes—is business-critical.

And graphic communications companies have an additional key difference from both offices and in-plants in that they establish green policies for the whole firm, not just for print and document management. Indeed, some have achieved elite status as environmental leaders among U.S. corporations.

Increasingly, production environments see environmental sustainability as a must-have capability. In a pre-recession survey of 800 printers by Reed Business Research and co-sponsored by Day International/Flint Group and Xerox, 75 percent of print providers said customer attention to sustainable print was on the rise. And more and more requests for proposals seek solutions. Print providers who can't provide them don't make the consideration list.

Of course, production facilities have many other reasons for seeking green solutions, including meeting regulatory requirements. Additional benefits can include reduced costs, a safer and more comfortable work environment, positioning as a concerned and responsible community citizen, and market differentiation.

Like the print provider, the print provider's customer may seek green products and services for a range of selfish and self-less reasons. Print buyers can be placed into four categories:²

- Laggards (40 percent) don't see sustainability as their problem, need prompting
- Just emerging awareness (30 percent) not sure where to begin
- Enlightened green (25 percent) recognize cost benefits and are prepared to act
- Ultra green (5 percent) are committed to green solutions

Any serious commitment to sustainability begins with a plan that comprehends the operation's environmental impact. Minimally, it should establish timetables for achieving various goals for recycling/reuse, reducing waste, carbon footprint reduction and other relevant metrics, and appoint someone to track progress. It's a platform for optimizing sustainability in production equipment, processes, facilities management and the solutions offered to customers.

Paper, ink and equipment

Paper supplies present three opportunities to have an environmental impact:

- By recycling paper waste—a profitable practice for many print providers.
- By moving to paperless proofing and workflow with systems like Xerox® FreeFlow® products to eliminate print and delivery costs while accelerating turnaround.
- By offering green paper choices to customers, including recycled paper and paper sourced from certified environmentally sustainable supply chains. In addition, print shops can be certified for their green roles in the sustainable supply chain.

Chain-of-custody certifications are available from independent nonprofit organizations that follow rigorous standards for sustainable forestry that address social and economic, as well as environmental concerns. The three that are most widely known are:

- The Forest Stewardship Council, which has certified more than 100 million hectares of forest worldwide—about 7 percent of the world's productive forests—and awarded more than 7,500 FSC certificates.
- The Programme for the Endorsement of Forest Certification, the world's largest forest certification umbrella organization, which has certified more than 200 million hectares of forests and awarded more than 3,500 PEFC certificates.
- The Sustainable Forestry Initiative, which provides a single, PEFC-endorsed standard for North America covering 135 million acres of forest and involving more than 320 facilities.

Papers that use chlorine as a bleaching agent should be avoided. Chlorine is a hazardous chemical that can bond chemically with carbon-based compounds to form toxic chemicals, including cancer-causing dioxins, which are difficult to remove from the environment. ECF (Elemental Chlorine Free) papers are widely available.

Ink materials also are a concern. In offset printing, vegetable- and soy-based inks are environmentally preferred over petroleum-based inks. Xerox® toners are non-toxic, so they generate no hazardous waste. And the same Xerox Green World Alliance supplies return program that facilitates recycling of office toner cartridges and bottles is available for production products, as well.

Among available printing technologies, digital presses are not only the best source of business growth in printing, they're also an environmentally responsible choice. Digital uses fewer solvents than most offset presses. Xerox® toners and containers are not broadly regulated as hazardous waste, nor do they use any VOC (volatile organic compound) solvents.

Digital processes also result in less waste than other technologies. Print-on-demand practices deliver only the number of pieces required, cutting energy use for warehousing and reducing waste by as much as 30 percent. Distribute-and-print networks do the same over long distances—and also reduce energy-intensive transportation. Personalized printing further cuts page volumes by targeting information more precisely. For example, health maintenance organizations can provide new members with more relevant, localized practitioner directories, rather than the bulky full list.

Environmentally responsible press choices are those that are designed for recycling. For example, most parts on the Xerox iGen3® and iGen4® Digital Production Presses can be recycled or remanufactured, and more than 80 percent of the waste they produce can be reused or sent back to the manufacturer.

Many leadership green graphic communications companies seek to do business with suppliers who can demonstrate equally strong commitments to green business practices.

Green production facilities

A plant's physical design and operational policies also have significant environmental consequences. Greener designs better control energy requirements and deliver an optimally safe and comfortable work environment.

Older facilities can be brought up to date with a green makeover. Upgrades can include energy-efficient lighting systems, improved insulation, sealing of windows and exhaust units, and more effective humidity controls and thermostats. Policies such as powering down equipment when not in use can reduce energy use.

Another step to consider is to power operations with renewable solar and wind energy. The cost is typically more than standard service, but the value to the environment and the public visibility of a company's commitment—makes this a worthwhile proposition for some print providers. Some customers will appreciate being able to include the tagline "produced with 100% renewable wind energy" in their marketing materials.

Monitoring VOC emission levels and making efforts to reduce them is a smart business practice that maintains the safest possible environment for employees and the community. In some areas, such monitoring is a regulatory requirement. For a few thousand dollars, an engineering firm can test the plant, identify the higher risk VOCs and offer recommendations on improving the situation. Annual checks are recommended.

Print shops that want to certify their environmental sustainability can apply for ISO 14001 certification, an international standard, which specifies requirements for an environmental management system. The system can improve overall shop performance as well as sustainability.

Some of the most ambitious firms also set goals for reducing their overall carbon footprint, by tracking and reducing greenhouse gas emissions from their plant, office, shipping and transportation services, and other operations. This represents leadership commitment.

Leading customers to green

With green practices in place, print providers have an opportunity to lead their customers to more environmentally sustainable communications programs. Some print providers play a consultant role, helping customers to design pieces that minimize environmental impact from conception to manufacturing, use and end of life, for example. Some also offer measurement services, to track the green benefits of their sustainability solutions.

Xerox recommends taking a solutions approach, demonstrating both business and green benefits. Here's an overview of six leading green solutions that are driven by digital printing:

Transactional-promotional documents

Transactional-promotional (transpromo) communications provides a significant opportunity in a large, growing market. In North America, full-color page output is projected to grow by 154 percent annually from 2007 to 2015, when nearly 40 billion pages will be produced, according to market-research firm Caslon, Inc.

Transpromo communications serve two missions. Like transactional documents, they present data from various transactions in the form of an invoice, statement or report. But unlike traditional transactional communications, they also incorporate marketing messages that are targeted to be relevant to the recipient.

Therein lies their key contribution to environmental sustainability—and to the bottom lines of print providers and print customers. By combining two documents that have been traditionally produced and mailed independently, transpromo cuts print and mail volume, thereby reducing production and postage costs, paper usage and delivery-related carbon emissions.

Transpromo also delivers business results. Transactional documents are opened and read at least once by 95 percent of recipients, according to market-research firm InfoTrends. That's a much better rate than alternatives for delivering marketing promotions, such as direct mail and e-mail. Further, transpromo messages can be precisely personalized to each recipient based upon data in the transactional database to make them highly relevant. And a single workflow system can produce both paper-based and paperless transactional documents, enabling a phased transition to electronic documents.

Xerox invented the first laser printer in 1977 to serve the transactional print market, and has brought many leadership print and workflow products to the market since then. The experience and market knowledge the company has gained over the years, the complete and well-rounded product line and the wealth of leadership partners are among the advantages Xerox brings.

Providing the application requires strong data skills, secure and error-free operations, and expert mailing services, as well as digital color printing. Key providers are data center service bureaus and in-house data-center production print facilities in almost any industry that produces transactional documents. Many of the highest volume producers are in telecommunications, utilities, financial services, insurance, manufacturing and retail.

Photo publishing

In the last decade, digital cameras swept into the marketplace, overtaking film cameras as the leading technology for the world's picture taking and forever transforming photo processing—and printing.

Film-processing revenues peaked in 2005, displaced by rapidly growing demand for digitally printed specialty photo products, such as books, calendars, and greeting and trading cards. Market-research firm InfoTrends projects revenue generated from these products will more than double from 2008 to 2013, achieving a 22 percent compound annual growth rate to surpass \$2.5 billion. It's one of the largest growth opportunities for digital color printing.

The market's transformation also has significant environmental implications. Film processing uses hazardous chemicals in its developer and fixer solutions and cleaning agents. Digital photography totally bypasses these steps, eliminating the use of hazardous chemicals and the associated costs and risks.

For photo image processing operations, digital photo specialty products offer environmental advantages over traditional film processing. They also represent the market's best growth opportunities, and they can be very profitable. According to Photofinishing News Consulting, profit from a single photo book can easily equal that of 500 four-by-six-inch prints.

Xerox and its business partners offer complete solutions for photo specialty products businesses, including the printing and finishing technology, the order and workflow systems, and business development tools and services to help the business succeed. Xerographic digital printers and presses have won numerous photo print image quality awards. They employ a wide range of automated image controls, enabling them to run unattended for long stretches, to minimize press operator time. Such automation is critical to large-volume production.

Key opportunities for production printers include becoming a manufacturing partner to companies that already have a customer base, and focusing on selling niche products to businesses and organizations, such as trading cards for youth sports leagues. For image processing firms, digital specialty products help combat erosion in traditional film processing.

Packaging

Digitally printed packaging is an emerging application that is in an early adopter phase. First movers can still gain powerful advantages in a worldwide market that is expected to grow from \$580 million in 2005 to \$6 billion by 2015, according to Pira International.

Digital printing is surprisingly well suited to many packaging applications. Image quality is right on target, and corporate colors can be matched on most digital presses. Image durability is quite acceptable and can be boosted with a varnish or laminate.

Further, digital printing delivers strong competitive, cost and environmental advantages when compared to traditional package printing technologies (offset, gravure, letterpress and screen). Production can use the just-in-time, print-on-demand approach to eliminate or reduce warehousing and associated cost, energy requirements and obsolescence waste. With fewer setup requirements, short runs are typically less expensive on digital presses. And variable-data printing can bring new value through personalization and customization for regional versioning and novelty items and for meeting pharmaceutical and healthcare needs for individual and custom-made packaging.

Xerox has developed the iGen3 and iGen4 presses with packaging applications in mind, and has built partnerships with packaging leaders to provide complete end-to-end solutions. Packaging remains a priority in research and development and industry alliances. In addition to printing and workflow systems, Xerox also offers business development resources to help customers succeed.

Candidates for digital packaging applications include graphic communications companies and in-plants that already do packaging, and graphic communications operations with an entrepreneurial willingness to pursue new applications with high growth and profit potential.

Books and manuals

The book publishing supply chain is undergoing a dramatic disruption today that makes book pages the top growth application for monochrome digital printing.

For years, offset printed books have dominated book production. In the trade book segment alone today, about 1.7 billion trade books are sold each year, accounting for about 500 billion offset pages. That is beginning to change, however. Caslon projects that the number of digitally printed book pages in the United States will grow from about 80 billion in 2008 to more than 140 billion in 2015, including about 20 billion new color pages.

Digital printing addresses many of the inefficiencies—and green deficiencies—in what is one of the most wasteful business models of any industry. Roughly 40 percent of the books that are printed and shipped each year are returned unsold to the publisher or destroyed outright.

Unlike offset, which requires long print runs to achieve economies of scale, digital printing can be profitable for quantities as low as a single book. By cost-effectively printing in only the quantity needed, digital eliminates the waste in traditional publishing. Distribute-and-print networks with book production in warehouses and stores also can reduce distribution costs and energy requirements.

Xerox has long developed and supplied leadership digital printing and workflow systems and has long-established partnerships with industry-leading software and finishing suppliers to provide complete end-to-end book manufacturing solutions. Xerox also offers business development resources to help customers succeed.

Publishers and book manufacturers clearly are prospects for digital book manufacturing systems. But they aren't alone. Many commercial printers, graphic communications companies and in-plants have opportunities for improving their customers' businesses with digital books. With new in-store production systems like the Espresso Book Machine® from On Demand Books, LLC, any retail location can produce its own books.

Collateral

Marketing collateral for promoting products and services—such as brochures, sell sheets, posters, catalogs and calendars—has long been a staple print application for graphic communications companies of all sizes. Today, collateral is the single largest opportunity for digital printing—and one of the fastest growing, too. According to Caslon, digital color printing of collateral in North America will grow by 147 percent from 2007 to 2015 to reach more than 80 billion pages. And it won't stop there—by 2020, volume is expected to reach 255 billion pages annually.

The shift is happening because digital printing delivers a long list of compelling benefits that make it impossible to ignore. These include 24/7 ordering and fulfillment, increased automation in production and order tracking, faster turnarounds, streamlined version control for more up-to-date content, and less warehousing and waste, reducing impact on the environment. Costs are often lower as well, especially when offset waste from obsolete collateral is figured in.

Most digital collateral production today begins with an online repository of digital assets. Customers order jobs on web storefronts that are tightly integrated with highly automated, near touchless digital production systems. This helps keep production costs low, while automated color management and tracking systems ensure top quality. It's a classic just-in-time, print-on demand model, with orders placed in the quantities needed, reducing or eliminating warehousing and waste.

Building on those capabilities, distributing orders electronically for printing nearest the point of need, can reduce transportation costs, accelerate delivery and further reduce environmental impact. Personalization and customization can enable networks of dealers, agents and retail locations to tailor collateral, while maintaining the central organization's branding consistency.

Xerox designs its digital color presses and workflow systems to optimize this heartland application. In cooperation with partners, Xerox offers end-to-end solutions that automate ordering and production, maintain optimal quality, integrate with offset workflow, and meet every folding, trimming and finishing requirement.

Nearly every organization produces collateral, and nearly every printing operation prints collateral. However, not every organization that creates collateral needs a web-based repository for managing and distributing them. The value of web-based systems is greatest for organizations with more collateral pieces, larger volumes per piece and more complex sales channels.

Direct mail

Direct mail is just behind collateral among the largest volume opportunities for digital color printing. Projections from Caslon for North America call for 128 percent growth in direct mail page volume from 2007 to 2015, to about 80 billion pages.

As the number of marketing messages we're exposed to on a daily basis grows seemingly exponentially, standing out in the crowd has become more challenging. One solution is to avoid the crowd by going direct, and today more than half of annual U.S. ad expenditures are for direct marketing, according to the Direct Marketing Association (DMA).

Electronic media, such as e-mail, personalized web sites (PURLs), and mobile and social media, have brought new life to direct marketing, with no- to low-cost distribution regardless of volume. Yet direct mail generally outperforms electronic media. The DMA's 2008 Response Rate Report found catalog response rates at 2.24 percent and direct mail at 2.15 percent, while email was less than .5 percent. And the best direct marketing results consistently come from campaigns that blend print and electronic media, with a print component helping to drive traffic to the desired electronic destination.

The cross-media approach also can bring production efficiencies—one set of personalization rules can apply across all media—and results can be tracked in a single dashboard. In addition, because highly relevant personalized direct mail generates better response rates than static solicitations, it can match traditional campaign results with fewer pieces, lowering cost and environmental impact.

As a pioneer of digital, variable information printing, Xerox has a rich history of contributing to improved direct mail business results. Over the years, Xerox has developed its digital print engines and workflow systems with an eye toward making direct marketing ever more relevant and productive. Many Xerox direct marketing offerings are benchmark in the industry.

Many print operations can be candidates for direct mail services, or for enhancing their current offerings. That noted, companies that compete for direct marketing business often have a range of specialized skills in data collection and manipulation, information technology, mailing services, marketing strategy and creative services. The best prospects are operations that already have some of these skills or show a proclivity toward developing them.

Looking ahead

The earth's population is currently around 6 billion. To provide the resources for everyone to share the Western World's standard of living would require the resources of three planets, according to the United Nations Environment Program.

Environmental sustainability efforts clearly will be required amid a growing population seeking ever-greater shares of the earth's resources.

Developing environmentally responsible solutions remains among the top priorities in Xerox research and development. Initiatives have looked at ways to generate green power from the sun and deep lake water. Product- and supplies-oriented efforts seek to conserve energy, eliminate potentially hazardous materials, enable recycling and reduce waste, while expanding the range of green substrates. Xerox will continue to do its part to foster sustainability in the company and among its customers, as it has since the 1960s.

And increasingly, we are helping Xerox customers develop green practices that benefit their company, their employees, their customers, their community and the world.

For more information, visit www.xerox.com/environment today.

1. Hansa/GRC 2009 Survey of 500 decision makers from companies weighted to represent the U.S. population of enterprise and midsized companies.
2. PRIMIR (the Print Industries Market Information and Research Organization), 2009.
3. Society of American Foresters, 2007, "The State of America's Forests."
4. U.S. Environmental Protection Agency, July 2008, "Fact Sheet: Management of Electronic Waste in the United States."
5. British Telecommunications plc, 2009, web-based survey of 150 IT professionals.
6. IDC, September 2008, U.S. Green IT Survey.
7. Hansa/GRC 2009 Survey of 500 decision makers from companies weighted to represent the U.S. population of enterprise and midsized companies. Reducing paper usage accounted for a mean percentage of nearly one-third of the total among five green practices ranked.
8. American Consumer Institute, Oct. 31, 2007, "Broadband Services: Economic and Environmental Benefits."
9. Gartner, Inc., March 11, 2009, "Is there anything greener than the dollar?" by Angela Di Maio.

