

**SUSTAINABLE PRINT:
ENVIRONMENTALLY-FRIENDLY PRACTICES
THAT ARE GOOD FOR THE FUTURE AND
FOR YOUR PRINT BUSINESS**

Environmental sustainability is an issue of increasing concern for our planet. This White Paper, prepared by Komori America, offers guidance for print businesses desiring to improve the sustainability of their print operations.

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1 INTRODUCTION

WHY READ THIS WHITE PAPER?

The past several decades have witnessed increasing concern over the impact of human activity on the global environment. What began in the 1970s with efforts to control pollution has evolved over time into a more comprehensive focus on environmental “sustainability”—an evaluation of the impact that using natural resources in the present has on the ability of future generations to meet their needs.¹

Today, a responsible environmental business strategy involves more than adopting a few “green” practices. Businesses are recognizing that incorporating a comprehensive sustainability program is not only beneficial for the environment, it can mean positive results for the bottom line.

This White Paper will provide practical advice on how your print business can implement a sustainability program that is good for the environment, good for future generations, and good for business.

There is little question that concern over environmental sustainability will continue to have a growing influence on how every business operates. A recent survey of corporate executives and managers found that ninety-two percent indicated that their company was addressing sustainability in some way.² Public interest in sustainability has led a growing number of print customers, vendor partners, employees, and others to evaluate whether they are working with a print business that has a defined environmental program as part of its business practices.

But more than just responding to public interest in the topic, or pressure from customers and business partners, some forward-thinking print businesses are realizing that a strong business case can be made for adopting a sustainable approach. These companies are finding that incorporating sustainability initiatives in their business model is helping them identify opportunities to reduce costs, improve efficiencies, and develop new revenue streams.

2**SUSTAINABILITY: WHAT DOES IT MEAN
TO BE MORE THAN GREEN?**

Humanity's demand on the planet's resources has more than doubled over the past forty-five years ...

We commonly think of “green” products and practices as those that are environmentally-friendly. Using recycled paper, for example, is a “green” practice that reduces the harvesting of trees and the amount of waste that will ultimately end up in a landfill. The terms “green” and “sustainable” are often used interchangeably, but they don’t mean the same thing. Sustainability moves beyond whether or not products or practices are “green” to look at whether they are able to meet the needs of the present without compromising the needs of the future. So while an Energy Star appliance may be green because of its energy efficiency, it might not be considered sustainable if the raw material use, carbon footprint, and waste associated with producing, distributing, and disposing of it degrade the environment and the availability of resources in the future.

Humanity’s demand on the planet’s resources has more than doubled over the past forty-five years as a result of population growth and individual consumption. At present, the global consumption of natural resources exceeds the world’s capacity to regenerate them by about 30 percent.³ This imbalance in our ecosystem is by definition unsustainable, and poses a growing threat as waste pollutes our land, water, and air, and we experience deforestation, declining biodiversity and the negative effects of climate change that will not only impact our lives, but also the lives of future generations.

3 REASONS YOUR PRINT BUSINESS SHOULD CONSIDER ADOPTING A SUSTAINABILITY PROGRAM

While adopting sustainable practices in your print business is clearly the right thing to do for the planet, a case can also be made that incorporating sustainability as part of your operations will be good for your business as well.

Forest Reinhardt of Harvard Business School puts it this way:

*"Managers should look at environmental problems as business issues. They should make environmental investments for the same reasons they make other investments: because they expect them to deliver positive returns or to reduce risks. Managers need to go beyond the question 'Does it pay to be green?' and ask instead 'Under what circumstances do particular kinds of environmental investments deliver benefits?' "*⁴

Initiating a sustainability program in your print business has many potential benefits, including:

- Uncovering inefficiencies and reducing waste for improved profitability
- Differentiating your product and service offerings in a way that appeals to the growing number of environmentally-conscious consumers and print buyers
- Aligning your business with the sustainability initiatives of business partners and customers
- Reducing the risk of non-compliance with government regulation
- More efficient use of key inputs and commodities that may become scarce or expensive over time
- Improved employee satisfaction and company reputation

In other words, instead of looking at sustainability as simply an obligation your business owes to society or the planet, view it as an opportunity to proactively address what will certainly be a driving influence in every aspect of your business, and every business, going forward. Being proactive about sustainability can prove to be a catalyst for increased market opportunities and improved efficiency and profitability.

3**REASONS YOUR PRINT BUSINESS SHOULD
CONSIDER ADOPTING A SUSTAINABILITY PROGRAM**

J.S. McCarthy Printers: Making the Environment Part of its Core Business Success



J.S. McCarthy Printers is one of New England's oldest and largest sheetfed printing operations. Rick Tardiff, president and owner of J.S. McCarthy, says that some environmental considerations have always been part of his and other print businesses. "We've always been involved in recycling paper to cut costs," said Tardiff.

Growing customer demand and an interest in cutting costs led McCarthy to expand its environmental initiatives approximately four years ago. "Printing used to be a three-legged stool—quality, service, and price. Now we look at environmental responsibility as the fourth leg. Customers have come to expect it, and larger companies—Fortune 1000's for example—are requiring that their partners be environmentally responsible," Tardiff explained.

“Customers have come to expect environmental responsibility ...”

J.S. McCarthy's approach to improving its sustainability started with evaluating its existing environmental initiatives. "Back when environmental initiatives weren't as popular, we were recycling paper. That's a pretty important piece of an environmental initiative, but it was something we were already doing. So we looked at it and said, 'OK, let's measure it. Let's see how we can do it better.' And from there, we just started addressing the larger items from the recycling standpoint—from paper to corrugated to wood to plastic to polywrap to metal. Then from an operations standpoint, we sought improvements in makeready time, makeready sheets, and friendlier chemicals and inks. So again, we looked at the larger issues. We do 750 makereadies a month on two presses. If we can eliminate five minutes from each one of those makereadies, we're saving time and electricity, and we're saving a tremendous amount of paper. We save approximately six million sheets of paper a year with efficient makereadies."

The company has taken environmental sustainability even further, purchasing wind power credits from Clean Currents to cover 100 percent of the energy it needs, which in turn supports new wind power projects.

J.S. McCarthy's environmental efforts, including the efficiencies of its presses, have resulted in tens of thousands of dollars in savings and have been responsible for the company winning several \$100,000+ jobs over competitors.

Tardiff's advice for printers who want to intensify their environmental efforts, "Look at your current initiatives first and find out where you can improve those. Form a team within the company, because you want everyone's buy-in on your environmental efforts. And you can get a great amount of information and support from peer groups, your industry associations, and also vendors because they have experience with others who have made it work."

4 UNDERSTANDING THE LIFE-CYCLE APPROACH TO SUSTAINABILITY

Initial efforts to improve sustainability focused primarily on reducing the environmental impacts related to material inputs, processing and manufacturing, and product distribution. Walmart was an early corporate leader in this effort, setting eco-friendly standards for the packaging and transportation of products that vendors supplied for its Walmart and Sam’s Club stores.

While these efforts are important, it has been recognized that making significant advancement in sustainability will require looking beyond these elements to the rest of the product life cycle, which, as Diagram 1 depicts, includes consideration of the impact of product design, use, and end-of-use.⁵ The goal of life-cycle analysis is to see how all the choices related to a product at all parts of the life-cycle impact ultimate sustainability. A package design, for example, can impact not only the material inputs needed to produce it, but also transportation costs, energy costs associated with the amount of space needed to store or display the product, and disposal or recycling options.

The goal of life-cycle analysis is to see how all the choices related to a product at all parts of the life-cycle impact ultimate sustainability.

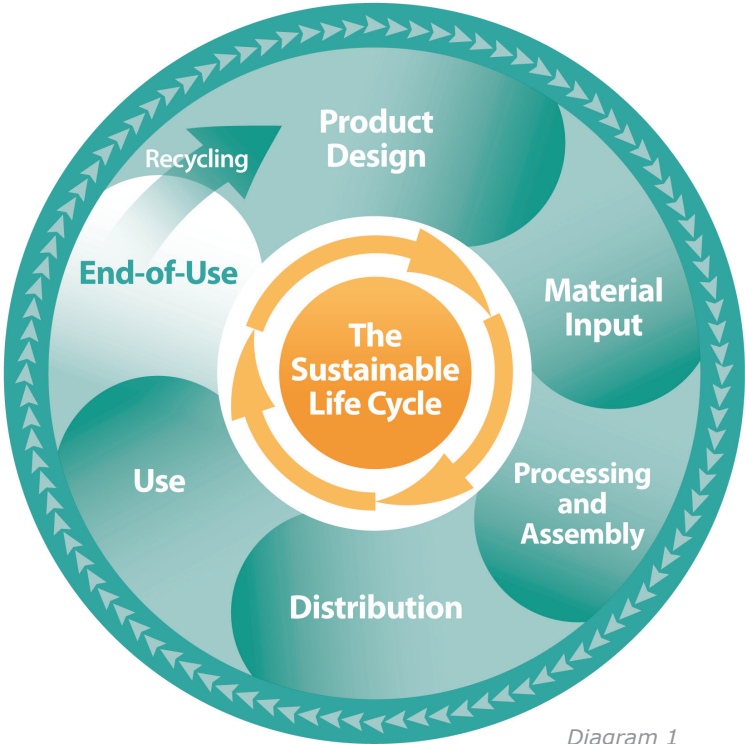


Diagram 1

5 IMPLEMENTING A SUSTAINABILITY PROGRAM FOR YOUR PRINT BUSINESS

Once you've decided that your print business will benefit from moving beyond employing a few green practices to implementing a true sustainability program, the next question becomes: **"Where do we start?"**



Excellent guidelines for implementing a sustainability program have been developed by the Sustainable Green Printing (SGP) Partnership, an organization with the stated mission *"to encourage and promote participation in the worldwide movement to reduce environmental impact and increase social responsibility of the graphic communications industry through sustainable green practices."*⁶

The SGP Partnership divides sustainability considerations for the graphic communication industry into these categories: *product*, *process* and *envelope*. Addressing all three of these elements is important when implementing a sustainability program:

- **Product** includes the design aspects and input material management to create the product.
- **Process** includes all manufacturing steps (e.g. prepress, press, and postpress) involved with converting raw materials into a finished product including process by-products (e.g. solid wastes, air pollution, and wastewater) that have an environmental, health, and safety impact.
- **Envelope** includes all the manufacturing support activities and involves consideration of the building, grounds, utilities, employee health and safety, and other functions at an individual site.

In the view of the SGP Partnership, sustainability is not limited to the environmental dimension, but also includes corporate social responsibility and corporate citizenship elements.

5**IMPLEMENTING A SUSTAINABILITY PROGRAM FOR YOUR PRINT BUSINESS**

The SGP Partnership recognizes the following guiding principles for sustainable business practices:

- **Employ**, wherever and whenever possible, materials derived from renewable resources or with low environmental impact, maximizing recycling and recovery efforts with efficient utilization of renewable energy.
- **Encourage** the adoption of changes within the supply chain by strongly recommending the use of raw materials that do not threaten or harm future generations.
- **Educate** the customer and ultimate consumer regarding the benefits of a restorative economy.

Companies can become an SGP Certified Facility by meeting a set of sustainability criteria. The SGP Partnership makes a list of certified SGP Certified Facilities available to the print buying community so that they can easily identify and contact a graphic communication facility within their area with a certified sustainability program.

5 IMPLEMENTING A SUSTAINABILITY PROGRAM FOR YOUR PRINT BUSINESS

Whether or not your print business chooses to pursue certification, the SGP Partnership certification criteria provide a useful guide for developing and implementing a sustainability program in your facilities. These criteria require:

- The creation of a Sustainability Committee to identify areas for improvement and facilitate communication on sustainability
- The adoption of a written sustainability policy setting out the company's commitment to sustainable business practices
- Identifying goals and defining procedures to implement the sustainability program and best practices recommended by the SGP Partnership
- An active program to assess performance and institute corrective action, and
- A documented management review of performance against the established objectives and targets of the program.⁷



Printing Industries of America has also compiled a number of useful resources for implementing a sustainability program, including a guide for preparing a sustainability policy⁸ and a step-by-step on-line manual, *The Green Guide for Graphic Communications: Growing and Profiting through Sustainability*.⁹

Printers seeking to incorporate sustainable business practices have many opportunities to conserve resources and lessen their overall carbon footprint.

As businesses and consumers become more conscious of environmental considerations, the demand to partner with an eco-friendly printer will certainly increase. Printers seeking to incorporate sustainable business practices have many opportunities to conserve resources and lessen their overall carbon footprint.

A great place to start is by assessing your current practices, which will likely identify some obvious ways to quickly make improvements. Working from your assessment, you will be able to implement a set of ongoing practices and established procedures to help achieve your program's objectives.

Following the Product, Process, and Envelope outline, here are a number of items to take into consideration.

I. Product Considerations

Elements of product design and input material choices are major contributors to a product's ultimate sustainability. Initial discussions with your customer can improve the sustainability of a job by carefully evaluating a number of factors. The American Institute of Graphic Arts offers the following among its principles of environmentally responsible print design:

- Design features and functions to use less material and energy
- Design for recyclability, reusability and recoverability of energy and materials
- Select materials with less impact and toxicity for air, water, and solid waste streams
- Select lower impact packaging
- Design for reduced energy use, water use, and waste impacts during product use
- Design to maximize the length of the product's useful life¹⁰

Choosing Eco-Friendly Substrates

There are a number of environmentally-friendly choices that can be made when it comes to sourcing paper. Printers should make sure that paper comes from a third-party certified resource that ensures sustainable and well-managed forests, such as the Forest Stewardship Council (FSC).

Certification programs for substrates include:

- **Forest Stewardship Council**



In addition to setting strict standards for responsible forest management, the FSC also offers certification for printers who have procedures in place that meet FSC standards for paper usage and job tracking. In order to use the FSC logo as an environmental claim on paper, the product must have flowed through the FSC “chain-of-custody” from the FSC-certified forest, to a paper manufacturer, merchant, and printer who all have FSC chain-of-custody certification.¹¹

- **Sustainable Forestry Initiative (SFI)**



Printers, publishers, distributors, and merchants are turning to SFI-certified papers and packaging materials to meet the growing demand for responsibly sourced forest products. SFI “percent content” and fiber sourcing labels make sustainable forestry more transparent.

The SFI program is committed to improving the practice of forestry on all forestlands in North America, whether boreal forests or plantation forests, naturally regenerated or planted. Its philosophy is that healthy, productive forests yield immense environmental, social and economic benefits, and mitigate the impacts of climate change by absorbing and storing carbon in trees, soil, and biomass.

- **Programme for the Endorsement of Forest Certification (PEFC)**



The Programme for the Endorsement of Forest Certification (PEFC) is an international non-profit, non-governmental organization dedicated to promoting Sustainable Forest Management (SFM) through independent third-party certification. PEFC works throughout the entire forest supply chain to promote good practice in the forest and to ensure that timber and non-timber forest products are produced with respect for the highest ecological, social, and ethical standards.

Printers should also look to papers with a high pre-consumer waste or post-consumer waste (PCW) content, which can range up to 100 percent. In addition to saving trees, the use of paper with high PCW content decreases paper waste ending up in landfills.

100% virgin paper:

Emits 5,483 to 6,855 pounds of greenhouse gases and consumes 15-26 trees per short ton.

30% post-consumer recycled paper:

Emits approx. 10-15% less greenhouse gases, and saves the equivalent of 4 to 8 trees per short ton

50% post-consumer recycled paper:

Emits approx. 19-25% less greenhouse gases, and saves the equivalent of 8 to 13 trees per short ton

100% post-consumer recycled paper:

Emits 25-50% less greenhouse gases, and consumes no trees¹²

Another step in sourcing paper responsibly is considering the bleaching methods used in paper production. The use of chlorine and/or chlorine compounds during the bleaching process of pulp and paper produces toxins that can enter the environment, remain intact for long periods of time, and pose a significant health and environmental risk. When considering alternatives, here is what to look for:

Processed Chlorine Free (PCF) applies to recovered paper fiber. The recycled and deinked paper fibers are whitened without any chlorine. The Environmental Paper Network advocates PCF as the most environmentally preferable option.

Totally Chlorine Free (TCF) paper is also whitened without any chlorine bleaching, but can only apply to 100% virgin fiber paper and not to recycled paper.

Enhanced ECF with ozone or hydrogen peroxide. This method substitutes ozone or hydrogen peroxide for chlorine or chlorine dioxides as a brightening agent in the initial stages of the bleaching process. This process is inferior from an environmental standpoint to PCF and TCF because it uses chlorine dioxide in the final stages of bleaching. However, this process is preferable to other ECF options because it improves the quality and recovery of mill wastewater.

Enhanced ECF with extended or oxygen delignification. This method removes more lignin from the wood before bleaching than the traditional ECF method, reducing the bleaching chemicals required. In addition, compared with traditional ECF, this process reduces energy consumption and improves the quality of mill wastewater.

Elemental Chlorine Free (ECF) is a bleaching process that substitutes chlorine dioxide for elemental chlorine. Compared to elemental chlorine bleaching processes, ECF bleaching reduces the formation of many chlorinated organic compounds.¹³

Finally, there are many types of alternative “tree free” fibers which can be used as printing substrates, including hemp, eucalyptus, cotton, and agricultural by-products such as cereal straws and corn stalks.



The Environmental Defense Fund has created an online Paper Calculator that can help compare the environmental impact of various paper choices across their full lifecycles.¹⁴

Using Sustainable Ink, Varnishes and Coatings, and Processes

Printers interested in incorporating sustainable practices in the pressroom have an array of high quality choices when it comes to ink.

Vegetable-Based Inks

The use of vegetable-based instead of petroleum-based inks can minimize volatile organic compound (VOC) emissions, reducing ozone damaging contaminants and improving the pressroom air quality. Using vegetable-based inks can also reduce the energy required for print production. Soy inks are very bright and yield more impressions, reducing the amount of ink needed for a job, and are also easier on the printing press. Soy inks and other vegetable inks are renewable and clean, making them an excellent choice for eco-friendly printing.

UV Inks

UV inks contain little or no solvents and therefore do not emit VOCs. Unlike conventional inks, UV inks can be left in the ink fountain overnight without skinning, which reduces cleaning time and wasted ink.

Varnishes and Coatings

Using water-based varnishes and coatings, instead of oil-based, will reduce VOC emissions. While most UV coatings contain little or no volatile solvents, leftover waste should be recycled.

Waterless Printing

Waterless printing is an offset lithographic printing process that eliminates the water used in conventional lithography. It uses silicone rubber-coated printing plates and specially formulated inks, and a temperature-control system for the waterless presses. This process does not require foundation solution and significantly reduces the release of volatile organic compounds (VOCs) into the atmosphere from alcohol and other drying chemicals. Waterless printing techniques can produce excellent print quality and improve productivity.¹⁵

II. Process Considerations

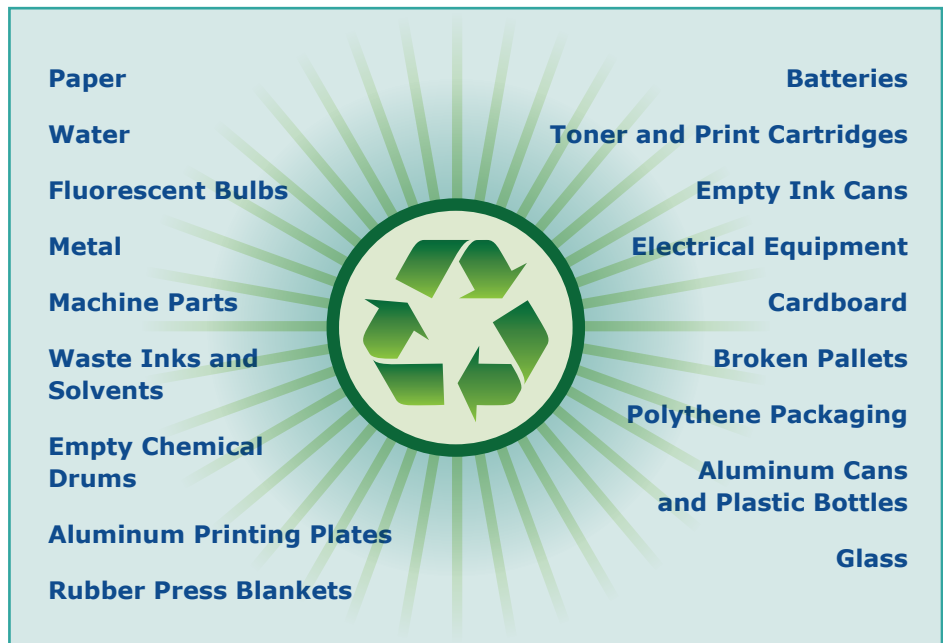
Every step in the manufacturing process has an environmental impact, as well as an impact on health and safety. Careful evaluation of practices in the prepress, press, and postpress processes can reduce waste and improve sustainability. Here are a few considerations:

- Evaluate environmental, health and safety aspects of facility air quality, equipment and material choices, and equipment utilization
- Employ the three “R’s”—Reduce, Reuse, and Recycle to minimize production wastes
- Seek to be as efficient as possible in the use of energy
- Establish procedures for the proper handling, efficient use, and disposal of inks, solvents and other chemicals to minimize waste and exposure
- Provide for the proper disposal of wastewater, avoiding discharge in a septic system
- Minimize makeready waste and other waste during production runs
- Establish accurate ink, coating, adhesive, and solvent estimation methods to reduce waste
- Train employees on proper procedures for covering, sealing, and storing of partially used containers of inks and chemicals and for proper storing of soiled shop towels¹⁶

6 AN OVERVIEW OF SUSTAINABILITY CONSIDERATIONS FOR THE PRINT BUSINESS

Recycling

Recycling is an important eco-friendly practice for print facilities. All of the following print by-products can be recycled:¹⁷



Having an ink recycling program in place is also an important consideration. Popular recycling techniques include blending colored inks to produce black ink, donating unused ink to schools and other users, or sending leftover ink to a fuel blending recycler.

Choosing Printing Press Equipment that advances your sustainability goals

In choosing print equipment, look for a manufacturer that has ISO 14001 certification for its responsible environmental practices.

The following are some features available in state-of-the-art press equipment that can help a printer run an environmentally responsible operation:

- High speed inking systems with self-learning capabilities enable faster makeready and job changeover times, reduces operator stress and manual operations, and can dramatically reduce waste
- Advanced dampening systems can significantly reduce the use of alcohol, improving air quality and eco-management
- Fully automatic plate changing technology reduces ink volumes and waste
- Technology reducing noise emissions improves the pressroom environment
- Look for press equipment that has been awarded a BG Emission Test Certificate

Impress Communications, Inc.: Approaching Sustainability From Every Angle



For Impress Communications in Chatsworth California, a move to a new building in 2007 provided an opportunity to intensify its sustainability initiatives. “We were able to take a number of steps to reduce the environmental impact of our facility, including putting thermostats on timers, installing energy-efficient lighting, improving natural lighting, and using cement flooring instead of carpeting,” explained Paul Marino, president of Impress.

Sustainability plays a central role when it comes to the operations at Impress as well. “We stagger our shifts to keep our energy usage lightest from 3 pm to 6 pm, when the load on the energy grid is highest,” said Marino. Additionally, Impress is an FSC certified printer and employs a wide variety of eco-friendly papers. Other initiatives include using paper crushers to consolidate all waste paper for recycling, using chemical-free recyclable aluminum plates, low VOC inks, and ink sentinels to improve the efficiency of ink use and allow for cartridge reuse on multiple jobs. Impress also has an in-house ink lab for accurate color matching and to incorporate recycled ink. “If we think we need twenty pounds of a color for a job, we will only produce approximately 12 pounds initially and see how much we’ve actually used when we get half way through the job, which reduces ink waste,” said Marino.



“*We were able to take a number of steps to reduce the environmental impact of our facility ...*”

Sustainability is an important aspect of the advice Impress provides to customers. The company has worked with many of its customers to create just-in-time ordering systems to reduce over-production and waste of printed marketing materials. Marino also sees helping customers develop an integrated communication strategy as part of the quest for sustainability. “It’s important to recognize that no one method of communication is the sustainable choice. Even emails require energy to power the servers that transmit them. Companies need to find the right balance between print and electronic communications,” said Marino.

Marino’s advice for improving the sustainability of a print business: “Take it one step at a time. Everything we’ve done has made us more sustainable, but there are always more things that can be done. Achieving sustainability is not about making a one-time change, it’s a process.”

III. Envelope Considerations

Lastly, printers can adopt management practices for their building, grounds, transportation methods, and utilities that reduce the size of their overall carbon footprint and environmental impact.

Packaging

Printers can take a number of steps to ensure that their product packaging is sustainable, including recycling and reusing pallets, repurposing paper waste for carton filling (avoiding packing peanuts), using paper tape for carton sealing, working with customers to reuse shipping cartons when possible, and using recyclable materials for packaging.

“Carbon Free” Shipping

Carbon neutral or carbon free shipment programs offer the ability to counter-balance the carbon dioxide emissions generated by the transport of packages. This is accomplished by “carbon offsetting,” which means that the climate emissions associated with shipping by truck or air freight are offset through purchases of renewable energy credits to achieve a net-zero impact on the earth’s climate.

Energy and Water Conservation

Renewable energy credits can also be purchased for facility energy use. Examining electricity, gas, and water use, installing energy efficient lighting systems and light bulbs, using equipment and techniques that reduce energy and water consumption, and reviewing transportation-related practices are all ways to improve energy conservation and reduce costs.

Facility Maintenance

There are many simple ways to improve sustainability when it comes to facility maintenance. Evaluating the use of fertilizers, pesticides, and insecticides, as well as using environmentally-safe janitorial supplies, all play a role in improving sustainability. A recycling program for paper, food and beverage containers, and office equipment can be implemented. Additionally, using energy saving features on computers and appliances, and avoiding plastic and styrofoam in the lunch or break room are quick and easy ways to promote corporate sustainability.

AN OVERVIEW OF SUSTAINABILITY CONSIDERATIONS FOR THE PRINT BUSINESS

Certifications

In addition to the certifications for paper sourcing previously discussed, printers can become recognized as an environmentally responsible printer by obtaining other certifications:

- **ISO 14001**



The International Organization for Standardization (ISO) has developed standards for the control of environmental aspects of business and the improvement of environmental performance.

- **SGP Partnership**



Printers certified through SGP have met extensive sustainability requirements in their print business. Additionally, SGP printers commit to annual reporting and a biennial certification audit requirement.

- **Green-e**



Green-e is the nation's leading independent certification and verification program for renewable energy and greenhouse gas emission reductions in the retail market. Green-e Marketplace is a program that allows companies to display the logo when they have purchased a qualifying amount of renewable energy and passed Green-e's verification standards.

- **The Rainforest Alliance**



The Rainforest Alliance works to conserve biodiversity and ensure sustainable livelihoods by transforming land-use practices, business practices, and consumer behavior.

Sharing Your Commitment

Once you've begun a sustainability program, it is important to share your commitment with all of your stakeholders. There are many ways to accomplish this, including highlighting it on your website and marketing materials, using the seals provided by certification organizations when appropriate, and publishing a report each year documenting what your company has done to improve its sustainability. It is important, however, to be familiar with applicable state and federal laws and regulatory guidelines concerning environmental marketing claims.

Letting your customers, vendor-partners, and community know about your commitment to the environment is a great way to educate others, differentiate your business, and increase revenue.

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