Defining Sustainable Green Printing Practices

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ABSTRACT

Sustainability in the printing industry requires a holistic approach that encompasses all aspects of a facility, the product, process and envelope. It is not only making positive changes for the environment, but ensuring the health and safety of employees and that all labor laws are met. There are many best management practices printers can implement to become more sustainable. The list is different for each company depending on their specific operation. An ongoing discovery process will continually find areas for improvement.

INTRODUCTION

Green initiatives and sustainable production practices in manufacturing operations has gained considerable momentum. For the printing industry, sustainability has reached a critical mass of interest due to the demands of customers, environmental groups, investment firms, government agencies, and consumers. Printers of all sizes are under pressure by their customers to demonstrate that they are producing products by using sustainable manufacturing processes.

However there has been much confusion as to what defines “sustainable.” For many, the term is limited to reducing the environmental footprint of a company, and is often referred to as being “green.” But, making positive environmental decisions is only one component of becoming sustainable. Sustainability is “the ability of this generation to meet its needs while not diminishing the ability of future generations to meet theirs.” Sustainable green printing has been further defined as the “incorporation of business practices that provide environmental stewardship and corporate social responsibility, including protection of employee health and safety, through the efficient use of renewable resources, energy, and recycling.”

Certainly, there are some cases in which companies are driven to embrace sustainable business practices simply because it is the right thing to do. And, when it is confirmed that sustainability has a drastic and positive effect on a company’s bottom line, those companies that jumped out to an early lead can anticipate a significant advantage over those that have lagged behind. Using sustainable practices has the potential to cut costs. But, if that’s not reason enough to jump right in, consider this: surveys suggest consumers are paying greater attention to the manner in which products are produced and some large corporations have taken notice. Companies such as Walmart, Coca-Cola, Nike and Subaru have spearheaded a wide array of green initiatives to their benefit, seeing vastly reduced amounts of waste, greenhouse gas and other pollutants and toxins. These companies are major buyers of printed products and expect sustainability throughout their supply chain.

BODY OF TEXT

Sustainability embodies a holistic approach. Because of the very nature of the finished product, the most obvious area of focus in the printing and packaging industry is the substrate and chemicals used. One way to become “greener” is by making informative decisions in the substrate arena. Some printers use paper with higher portions of post-consumer recycled content, elemental-chlorine free bleached paper or the facility has become chain-of-custody certified under the Forest Stewardship Council (FSC) or Sustainable Forestry Initiative (SFI). Film may be derived from renewable and compostable resources, such as polylactic acid (PLA), a corn-based material. Inks, coatings and adhesives choices provide other “green” opportunities for printers. Chemistry with low volatile organic compound (VOC) content, such as water-based or UV inks and low VOC adhesives help reduce a printer’s environmental footprint.

But none of these alone defines a sustainable printer. There must be sustainable practices throughout the facility. For example, envision a facility that uses water-based inks, but purchases vast amounts of non-recyclable substrate shipping it from a great distance, and is not in compliance with applicable OSHA and labor regulations - hardly a sustainable green printer. How about a facility that is not following applicable regulations and does not have an air emission permit, but is using PLA as its preferred substrate?
First and foremost, a sustainable printer must be in compliance with all applicable environmental, health, safety and labor regulations. It is not possible to be considered a sustainable green printer if the facility is not in compliance with established laws.

Holistic sustainability embodies three principle areas:

- **Product**: The design, input materials used to make it and the ultimate fate of the finished product.
- **Process**: The actual manufacturing process involving prepress, press and postpress.
- **Envelope**: The support activities that occur at a printing operation such as the building, grounds, maintenance, transportation, employees, etc.

In addition to the obvious concerns with the materials that form the product, printers must also be aware of the sustainability implications of the manufacturing process, as well as the facility or envelope in which the manufacturing process takes place.

From prepress to finishing, the actual production process is full of opportunities to introduce sustainable manufacturing practices. Below is a list of best practices which printers should consider implementing to become more sustainable[1].

**Product**: In the design phase, open a discussion with your customer to evaluate the most efficient use of materials, layout, packaging, logistics and end of life cycle implications. Open a dialog with your suppliers to better understand and take measures to reduce impact associated with the sourcing of input materials. Discuss ways to reduce or eliminate redundant shipping, including shipping distances and optimization of routing and delivery systems. There may be methods to reduce or eliminate outdated materials and associated obsolescence. Provide accurate environmental, health and safety data on all input materials, including information on volatile organic compounds (VOCs)/air toxic (hazardous air pollutants - HAPs) content, heavy metals, persistent bioaccumulative toxic compounds, including maintenance of material safety data sheets (MSDSs). Explore options to reuse and recycle unused materials and disposable packaging such as cores, cartons, drums and cans. Try to use products that minimize or eliminate waste, use of minimal packaging, and establishment of take-back programs for unused materials. Develop an awareness of the implications of substrate characteristics including: biodegradability, compostability, recyclability and recycled content, including pre-and post-consumer content, source of virgin fiber for paper, source and content of other substrates, and amount of renewable energy used in the manufacturing process.

**Process**: Maintain acceptable indoor air quality through appropriate exposure monitoring, engineering controls and design characteristics of ventilation systems. Incorporate the 3 “R”s – Reduce, Reuse and Recycle to eliminate production wastes. Investigate the use of solvent recovery system for solvent-based plate chemistry and cleaning solvents where applicable and economical. Establish consumable inventory management system for recall and reuse, and maintain a “First-In, First-Out” (FIFO) use plan to maintain quality input materials and obsolescence prevention. Incorporate environmental, health and safety considerations into equipment and material purchases and utilization. Minimize energy use under the constraints of your print process. Establish a regular system for basic equipment maintenance including what should be done, when it will be done, who should do it, and procedures for documenting maintenance completion. Train employees on proper handling and use of inks, solvents and other chemicals to minimize waste and exposure. Ensure that no industrial wastewater is discharged to a septic system, which is defined as an on-site sewage treatment process.

When replacing electronic equipment, purchase Energy-Star compliant computers, monitors, servers, and appliances. Recycle scrap film and recover silver from the developing process. Utilize a proofing system that minimizes impact and is compatible with your manufacturing process. Such systems may include water-based, inkjet, dry sublimation and soft on-screen proofing systems. Extend the use of plate development chemistries by monitoring and replenishing through appropriate quality control systems. Ensure that no industrial wastewater is discharged to septic systems. If using liquid photopolymer
flexographic plates, collect and recycle any uncured polymer. Use perchloroethylene alternative solvent (PAS), water-washable, or dry plate development systems for flexographic operations.

Establish and follow operating procedures to minimize make-ready waste and waste during production runs. Evaluate and use the most environmentally sound materials that meet the application’s performance requirements. Establish ink, coating, adhesive and solvent estimation methods that are as accurate as possible to reduce waste. Implement procedures to minimize fugitive emissions, such as properly covering, sealing, and storing partially used containers of materials that contain VOCs and HAPs. Establish proper management practices to ensure that no chemicals are improperly disposed. Use inks that meet the Council of Northeast Governors Coalition’s (CONEG) requirements of no more than 100 ppm total for lead, mercury, cadmium and hexavalent chromium. Keep soiled shop towels in closed containers and do not allow them to air dry.

In the postpress area segregate and recycle trim cuttings, scrap and production waste. Establish and follow operating procedures to minimize waste from equipment setup or finishing operations. Evaluate and use the most environmentally sound materials that meet the application’s performance requirements.

**Envelope:** Ensure that packaging materials and procedures have been employed to minimize waste. Reuse packaging materials whenever possible. Investigate ways to optimize the movement of goods including internal product movement and off-site shipments using owned, leased or third-party transportation services.

When replacing equipment, purchase Energy-Star compliant (or equivalent, based on country of manufacture) equipment such as computers, monitors, servers, refrigerators and microwaves. Document, through an internal or outsourced audit, options to reduce energy use including occupancy sensors, programmable thermostats, energy efficient lighting, gas and water use and insulation and implement appropriate energy reduction projects.

Evaluate and minimize use of fertilizers, pesticides and insecticides. Evaluate and minimize potable water for supplemental water use. Consider developing a system for capturing rainwater (gray water) for irrigation purposes. When replacing landscaping, use native and low-water-use plants wherever possible. When possible, turn yard trimmings into mulch by chipping them or composting them. Consider letting leaves drop from trees and shrubs to act as natural mulch and using part of the grounds as a source of food for wildlife. Use an environmentally-safer ice melting chemical treatment on sidewalks.

Implement an office recycling program for paper, food and beverage containers and office equipment. When remodeling or replacing fixtures, use low-flow toilets, double-flush toilets, motion activated faucets and toilets, and other water and energy reducing items. When replacing janitorial supplies, use alternative materials that are less harmful to the environment and can include third-party recognized products.

Don’t forget the social aspects of sustainability! Comply with all relevant local, state, provincial and federal employment laws. A sustainable printer should provide an equal employment opportunity workplace. Make sure policies are in compliance with federal, state, and local child labor, wage/hour and immigration laws. Comply with minimum wage and overtime laws. If multiple languages are acceptable in facility, all plant rules, safety issues and training should be written to accommodate each language spoken in the facility, including safety postings, training manuals or other sustainability actions put in place.

Once companies begin to act aggressively on sustainability, they tend to unearth more opportunities, not less, than they expected to find, including tangible bottom-line impacts and new sources of competitive advantages. They find ways to reduce costs and create new revenue streams and develop more innovative business models. The study, *The Business of Sustainability*, discovered that 68 percent of business leaders with sustainability expertise cited improved financial returns as a benefit from their organization’s investments in sustainability initiatives, compared with only 32 percent of novices [2]. Practitioners with more knowledge tended to consider the economic, social and even political impacts of sustainability-related changes in the business landscape.
Sustainability is not a simple list of discrete actions, but a continuous improvement process, a journey that requires a holistic approach to the entire manufacturing process. To capitalize on the movement and turn it into a competitive advantage, printers need to have an approach that is both systematic and systemic.

Systematic means there is a plan in place that will allow for the identification of opportunities and applications of the appropriate resources to accomplish the activity. This is best accomplished by using some type of management system. It does not require becoming ISO 14000 certified. However, there needs to be structure established by which potential projects can be completed in an organized and timely fashion. As many printers are adopting Lean manufacturing approaches, this makes for a perfect opportunity to include green. The combination of the two can be very powerful.

Systemic means that all employees, from the receptionist to the CEO, become involved and engaged in the process of making the company more sustainable. By empowering the employees, companies have been able to unleash the power of creativity that resides in each employee.

For some printers, the prospect of altering long-standing workflows and production practices can be a daunting one, even if the benefits are obvious. The best approach is to do what is most appropriate for your company. Start by preparing an inventory to identify what is currently being done. Many companies have instituted green practices, such as installing computer-to-plate systems or recycling substrate, without having that goal in mind. The next step is to expand the inventory to identify those items that will have the most significant impact. For many it will most likely be substrate, followed by energy consumption, chemicals, inks, solvents and other VOC emissions. Focusing on trash can have significant benefits and starting an office paper recycling program can reap financial benefits with very little investment.

For those companies just starting, the best approach is to address simple and easily accessible targets to increase the chance of success. By working on one project at a time, the success rate and momentum will carry over to the next project and eventually all the projects will add up to big gains. To maximize the power of the employees and gain the most recognition, it is very important that all employees, vendors, customers and the community know and understand the goals and objectives and, most importantly, see the results.

Why not be publicly recognized for your facility’s sustainability efforts? The Sustainable Green Printing Partnership (SGP Partnership), an independent, non-profit, launched a certification program in August 2008 that verifies sustainable business practices. Visit www.sgppartnership.org for additional information, a listing of certified SGP Printers, as well as the SGP Applicants working toward certification.

REFERENCES

Defining Sustainable Green Printing Practices

Presented by:
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What does it mean to be “Sustainable?”

Meeting the needs of the present without compromising the needs of the future.
Sustainable Green Printing is...

The incorporation of green business practices that provide environmental stewardship and corporate social responsibility, including protection of employee health and safety through the efficient use of renewable resources, energy & recycling.

- SGP Partnership Stakeholder Group, 2008
Some Traditional Components of Sustainability

- Recyclable
- Less Toxic
- Renewable
- Compostable
- Biodegradable

- Recycled Paper
- Lower VOC Inks
- Certified Paper
- Polylactic Acid (PLA)
- Vegetable-based Inks
Holistic Approach...

- **Product**: Design aspects and input material management to create the product

- **Process**: All manufacturing steps (prepress, press & postpress) involved with converting raw materials into a finished product including process by-products that have an environmental, health and safety impact

- **Envelope**: All the manufacturing support activities and includes the building, grounds, utilities, employees, and other functions at an individual site
Holistic Approach...

- **People**: Employee health & safety
- **Planet**: Environment
- **Profit**: Bottom line
Why?

- Customer Demand
- Nike, Walmart, Ikea, Coca-Cola, Toyota, Subaru
- Environmental Groups
- Investment Groups
- Regulatory Agencies
- Business and Marketing
- Consumers
- Internal Issues
Sustainable Packaging

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<thead>
<tr>
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<th>2009</th>
<th>2014</th>
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<tr>
<td>Worldwide Packaging</td>
<td>$429 billion</td>
<td>$513 billion</td>
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<tr>
<td>Sustainable Packaging</td>
<td>$88 billion</td>
<td>$170 billion</td>
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- Pike Research Study, 2009
Elements of Sustainability

- Compliance with all applicable regulations
- Sustainability Policy
- Sustainability Management System
- Best Management Practices
- Transparency
- Goals & Objectives for continual improvement
A Must!

Federal, State & Local

Environmental, Health & Safety

Labor
Sustainability Policy

- Compliance with regulatory requirements
- Continuous improvement for issues including areas not subject to regulation
- Pollution prevention emphasizing reduction, reuse and recycling
- Sharing information on performance
Sustainability Management System

- Policy
- Committee
- Compliance
- Performance Objectives
- Checking & Corrective Actions
- Management Commitment
Best Management Practices

- **PRODUCT**: Explore use of products (inks, solvents, substrate) that minimize or eliminate waste.

- **PROCESS**: Train employees on proper handling and use of inks, solvents and other chemicals to minimize waste and exposure. Utilize a proofing system that minimizes impact and is compatible with your manufacturing process.

- **ENVELOPE**: Ensure that packaging materials and procedures have been employed to minimize waste. When replacing equipment purchase Energy-Star compliant items.
Transparency

- Public Reports
- Website
Goals & Objectives

- Goals are broad
- Objectives are **SMART**
  - *Specific*
  - *Measurable*
  - *Achievable*
  - *Realistic*
  - *Time-Bound*
For a Successful Program

- **Systematic** – Organizational Approach
  - Setting Goals & Objectives

- **Systemic** – Engage All Employees
  - Management and Staff
True statements from flexo printers on their sustainability journey...
“The Bottom Line”

- “Through our program we have reduced waste saving about $100,000 annually.”

- “We reduced one manufacturing waste by 25 tons and reduced purchases of another raw material by 80%.”

- “We found that 23% of our energy cost was compressed air. We’ll payback the cost of a upgraded system in 13 months.”
“The Bottom Line”

- “We are replacing our lighting in the warehouse to T8 fluorescents and using step-down lighting. As a result, we’ll also get better lighting. Payback will 15 months, plus a tax deduction!”

- “We’ll be sending 385 less tons to the landfill saving more than $10,000 (triple that if you’re not in the mid-west).”
Get recognized for your achievements and further improve your bottom line...
Sustainable Green Printing Partnership™
Sustainable Green Printing Partnership℠

- Independent, non-profit
- Created with input by all stakeholders
- All types of printers
- All sizes of printers
- United States & Canada
- Criteria as presented, plus an audit
- More than 50 in process, nearly 20 certified*

*As of Feb. 2010
“Our customers and the marketplace are demanding sustainable information, and in cases where Walmart is being supplied, sustainable goals are being required. So, in part, it is customer driven or our customer’s customer driven.”
Websites

www.sgpppartnership.org

www.flexography.org
Sustainability is a Journey with Opportunities to Benefit Your Company!
Defining Sustainable Green Printing Practices

Thank you!

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Please remember to turn in your evaluation sheet...