

## GLOBAL JOURNAL OF ENGINEERING SCIENCE AND RESEARCHES VOC SOLVENT RECOVERY IN PRINTING & PACKAGING INDUSTRIAL SECTIONS

Amaranand

M. Tech. (Print & Graphics Communication), GJUS&T, Hisar (Haryana)

---

### ABSTRACT

Many nonprofit organizations are still hesitant to make the leap to working only with green printers for fear that production costs will skyrocket. But with a bit of planning and the right production partners, green printing is easy and economical.

So, where do you begin? First, find a local printer that uses environmentally-responsible printing techniques. Once you've found the right printing partner, make sure that your designer connects with the print vendor early in the project's genesis. Problems can arise when the designer moves forward on a project without a clear understanding of what parameters need to be followed to facilitate an eco-friendly print job.

---

### I. INTRODUCTION

The threat of global warming is changing the way in which the corporate, government and nonprofit sectors are doing business. Recycling office paper and printer cartridges, buying from locally-based vendors and reducing energy use are eco-friendly practices that most nonprofits have adopted.

### II. PLAN WISELY FOR GREEN PRINTING

Next, you will want to develop your Green Printing Action Plan. Sound management practices will help you to minimize the use of chemicals and use raw products efficiently in the printing process. The following points should be part of your action plan:

Choose environmentally-preferable paper and inks – and clearly mark your documents to illustrate this – to publicly demonstrate your nonprofit's environmental commitment.

Choose chlorine-free paper with post-consumer fiber. Greening a print job starts before the ink hits the paper. Find out if your printer offers environmentally preferable paper.

Think green ink. Ask your printer about the possibility of using low-polluting (with a VOC content of less than five [5] percent) or recycled inks. Also, vegetable-based inks contain considerably lower VOCs than petroleum-based ones.

Use paper wisely by using both sides of each sheet. Avoid non-standard sizes for your print project. Since papers are produced in standard sheet sizes, you can save paper (and money) by getting the maximum number of copies from each sheet.

Turn a publication into a "self-mailer." Include your cover letter within the printed document.

Minimize your print project's ink coverage. Less ink needs less "press ready" time and less paper.

Look for a printer that uses a waterless printing system which eliminates the water or dampening system used in conventional printing.

Work with vendors that use renewable energy sources like wind power to take the next step in green printing.

Avoid varnishes and other coatings that may keep you from being able to recycle the piece later. However, if coating your printed piece will add significantly to its shelf life, then go ahead, as this will cut paper use over the long term. Don't render paper unrecyclable during the finishing and packaging phase by using certain binding adhesives, foils and plastic bags commonly used in printing and packaging.

Consider publishing your document online. The most environmentally-friendly publication doesn't exist on paper at all.

Not all environmentally-preferable options work with all printing processes. Ask your printer which inks and which papers will meet your needs. While the options are out there, sometimes the information is not. Finding the greenest printer for the specific job may take some self-education and research.

### **III. PRINTING GREEN: 12 THINGS YOU NEED TO KNOW**

#### **Essential tactics to assure environmental responsibility in printing practices**

##### ***1. Learn the lingo***

You'll need to be familiar with industry jargon to appropriately select environmentally friendly papers. Here are a few terms you'll often see:

- Virgin fiber—100-percent “pure” fiber from an original source
- Post-consumer content—Waste recovered from consumers and recycled
- VOCs—Volatile organic compounds (occur in petroleum-based printing ink)
- PCF—Processed chlorine-free
- TCF—Totally chlorine-free
- ECF—Elemental chlorine-free

##### ***2. Preserve and conserve***

The Recycled Products Cooperative estimates that over 100 million trees are cut each year to supply fiber for writing and printing papers in the United States. This is not only detrimental to forests, but to air quality and water reserves as well.

One way to preserve resources is to purchase recycled paper with high levels of post-consumer content. Using recycled paper saves landfill space and minimizes water and energy consumption. Check recycling symbols to see what percentage of recycled fiber was used during the manufacturing process.

##### ***3. Think about ink***

Do you know how your printer disposes of unused ink? If you're unsure, ask. Petroleum-based inks leach VOCs—which cause cancer and birth defects—into the soil when printed papers end up in landfills. These toxins can also be released into the air as fresh inks dry.

Soy ink is an excellent alternative to petroleum based inks. Soy ink uses soybean oil that's naturally low in VOCs. This smart substitute is sustainable, efficient, and cost-competitive. Many newspapers, magazines, and other materials are now printed with soy ink.

##### ***4. Do it digitally***

Digital Printing is recommended for economic reasons. Digital is ideal for short-run, four-color work for business cards, stationery, promotional pieces, and most print work that is less than 1,000 sheets of 14 x 20 inches.

This printing method even has advantages over soy inks. While soy is comprised of 86-percent oil—which isn't biodegradable—digital printing uses 100-percent nontoxic toner. Toner-based inks also produce less chemical waste.

### **5. Consider alternative papers**

Move over to pulp-based paper. A number of alternatives (like “tree-free” varieties) to traditional papers are now available such as Denim Blues (100-percent reclaimed blue jean cotton), and synthetic papers by Yupo because of their environmental attributes and durability.

For certain projects, we can use paper made from Kenaf and hemp, and a newer paper called TerraSkin, which is made from ground stone. TerraSkin is almost as strong as synthetic envelopes and it prints like a coated sheet. It also uses less ink, and is nontoxic and waterproof.

### **6. Choose better bleaching solutions**

Brighter, whiter papers are created by various bleaching processes. It’s a good idea to have a basic understanding of how manufacturers process their products so that you can select the best, most environmentally friendly papers for your projects.

Elemental chlorine was once extensively used to brighten paper products, but now chlorine dioxide (used in swimming pools) is a common substitute. This process yields ECF papers. Although chlorine compounds are safer than pure chlorine, some pollution still results. Better choices include PCF and TCF bleaching, which substitute oxygen-based compounds for chlorine compounds. Only the recycled portion of a recycled sheet has been bleached with PCF. Fewer TCF papers are available today because most papers contain some recycled content—TCF relates only to 100-percent virgin papers.

Only products deemed acceptable by the Chlorine Free Products Association are granted PCF and TCF emblems. Look for the symbols when purchasing recycled paper.

### **7. Educate your clients**

Many companies today are concerned with producing print materials and packaging made with sustainable resources. IBM, Coca-Cola, and Mc-Donald’s are just a few major businesses making an effort to publish shareholder reports on 100-percent recycled post-consumer content. But not all clients are familiar with “green” design and printing processes. You may find that you need to act as an eco-friendly project advisor.

### **8. Practice what you preach**

Set a good example to convince others to follow your lead. Consider incorporating these methods:

- Conserve ink use by determining whether print projects need to be full color. Could a two-color design suffice instead?
- Maximize ink staying power by substituting a Pantone color for metallic inks, which tend to degrade. (This reduces VOC emissions, too.)
- Avoid wasting paper by designing to standard press sheet sizes (e.g., 23 x 35, 25 x 38, 26 x 40, 28 x 40). If a job is large enough, your printer can order a special sheet size from the mill. Since paper is sold by the pound, this approach can also save your client money.

### **9. Offset cost with creativity**

Some environmentally friendly products may be a bit more expensive. It’s important, however, not to view pricing issues as constraints. Instead, think creatively to help balance benefits with costs. Design multifunctional projects—e.g., self-mailer/ program combos—to economize when using more expensive paper. Also, combining projects whenever possible is wise; one idea is to print business cards and postcards from the same recycled paper. In the long run your clients may save money, and they’ll also be honoring the environment.

### **10. Know industry standards**

The Environmental Protection Agency (EPA) mandates that federal agencies must use uncoated printing and writing papers containing at least 30-percent post-consumer content. Coated and commodity papers must contain a minimum of 10 percent. Consider using these guidelines when selecting paper for your projects, too. Become

familiar with other industry-issued standards. Important stamps of approval include the emblems of the Forest Stewardship Council (FSC) and Chlorine Free Product Association (CFPA). For these symbols to appear on products, they must meet specific standards determined by the International Standards Organization (ISO).

### ***11. Evaluate projects individually***

The first priority in design is to create an appealing, functional piece of work. It's imperative to do good design from an aesthetic standpoint. Consider options that will leave behind less waste. Lots of what's designed is thrown in the trash. Using recycled materials is necessary because so much is thrown away.

If a client won't switch to paper with a higher percentage of post-consumer recycled content, try finding a way to reduce the number of pages used instead. You might also recommend different paper types for different sections. For example, some publications use high-quality coated paper for advertisements and uncoated paper with higher postconsumer content for editorial sections.

### ***12. Stay informed***

Being environmentally responsible means staying current with new products and practices. Check what others are doing to help keep our quality of life at a premium.

#### **Conservation technology**

- Waterless presses: Water washable inks eliminate VOCs from the printing process.
- Windmill energy: This alternative energy source produces nonpolluting, wind-generated energy to manufacture 100- percent post-consumer paper.

#### **Top Ten Things you can do in the office to improve the environment**

- Conserve paper by printing in draft mode for draft copies and by printing two-sided.
- Use nontoxic correction fluid.
- Stock break rooms with silverware and coffee mugs instead of paper/plastic items.
- Buy 100-percent unbleached and/or reusable coffee filters.
- Donate old or unused office equipment to schools.
- Use a screensaver whenever you're away from your desk.
- Buy recycled office products.
- Reuse one-sided internal office forms for scratch paper and note taking.
- Shake toner cartridges occasionally to redistribute contents.
- Bike to work instead of driving.

## **IV. CONCLUSIONS**

Deforestation occurs around the globe. It is the act of essentially the removal of or burning of trees in a forest. It can occur for a number of various reasons, including the production of paper, logging industry, as well as urbanization and overpopulation. Nonetheless, the insatiableness and cut-throat competition is what is responsible for wrong practices. Many of us make a conscious effort to practice environmental responsibility. We haul old newspapers to local recycling centers. We use ink refill kits instead of buying new cartridges for our printers. And who doesn't have at least one blue recycling bin wedged underneath the desk? But is this enough? Social consciousness isn't just about making good paper and ink choices. A lot more of it has to do with how work is produced. For designers, this means keeping the environment in mind when planning projects. Making a commitment to practice environmentally responsible design can be challenging, but it's doable and highly rewarding. Starting today will help ensure a healthier quality of life for tomorrow.

#### **REFERENCES**

1. *about.com*
2. *waterless.org*
3. *greenhome.com*

4. *gregbarberco.com*
5. *graphicalliance.org*
6. *mohawkpapers.com*
7. *bsr.org/bsrconferences/index.html*
8. *aigasf.org/compostmodern/compost.html*
9. *[http://en.wikipedia.org/wiki/Paper\\_recycling](http://en.wikipedia.org/wiki/Paper_recycling)*
10. *[http://en.wikipedia.org/wiki/Volatile\\_organic\\_compound](http://en.wikipedia.org/wiki/Volatile_organic_compound)*
11. *Printing Technology (Edition 5.0) by Adams, Faux, Rieber*
12. *Helmut Kipphan, Handbook of Print Media, April-2000 Springer publication. Article;13.2.1.4/5/6/7, Page-1083*