# HP Indigo Environmental White Paper

"Environmental responsibility is good business. We've reached the tipping point where the price and performance of IT are no longer compromised by being green, but are now enhanced by it."

Mark Hurd, Chairman and CEO,
Hewlett-Packard Company

HP's commitment to the environment is part of our company culture. It was a concern of our founders, and HP continues to develop policies and initiatives that deliver increasingly high standards in all areas of environmental responsibility. It is important that an understanding of our policies and initiatives reaches all levels of our businesses and our worldwide customers. This white paper shows how the corporate vision translates into best practice and creative solutions, sustainability and responsibility in an important area of HP's business.

## Executive summary

HP helps its customers reduce their environmental impact with a portfolio that spans printing, personal computers, software, services and IT infrastructure.

HP's environmental policies and initiatives cover a very wide range of activities on a global scale. Whether it's compliance with local legislation, development of programmes specific to the needs of its many activities, or supporting its customers, working to protect the environment and conserve resources is a major part of HP's commercial life.

HP is committed to designing all its products and services with the environment in mind. This means that consideration of the impact on the environment of each HP product is considered from the beginning to the end of its life. In our operations we make environmental management a priority, and create a safe work environment that enables HP employees to work injury-free.

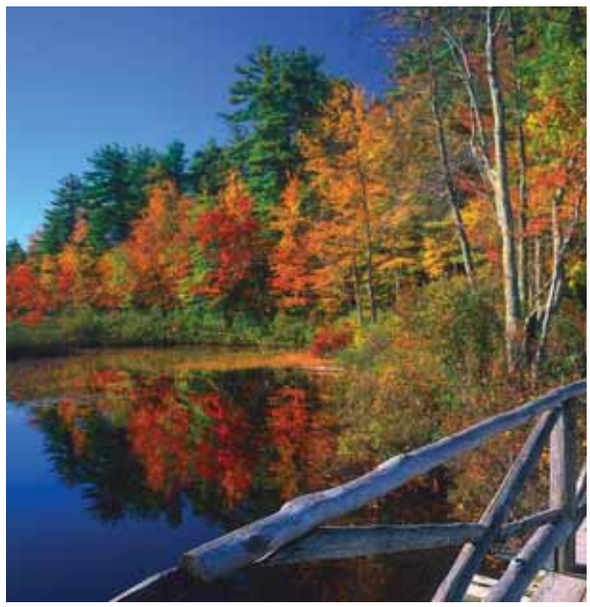
This commitment is met with a comprehensive environmental health and safety policy, strict environmental management of our operations and worldwide environmental programmes and services.

HP embraces manufacturing processes that are energy efficient, produce minimal waste and pollution. Waste materials are properly captured, stored, processed or otherwise disposed of. HP espouses ISO 14001 Environmental Management Standards in its manufacturing and HP Indigo presses are produced in compliance with these standards.

A logical consequence of designing for the environment is that operation of HP's products complies with strict standards that meet many of the worlds eco-label programmes such as Energy Star (US), Blue Angel (Germany) and TCO (Sweden). Product operation is not only designed to be energy efficient, but also waste efficient, including low VOC emissions (atmospheric), and containable liquid or solid waste.

At the end of a product's life, whether it's a desktop inkjet cartridge, or an HP Indigo press, procedures are in place for re-use or recycling.

Within HP's Imaging and Printing Group (IPG), the latest digital technology has been brought to the graphic arts industry and with it, new opportunities to reduce energy, resource use and reduce waste. While meeting the requirements of offices, sign, banner and wide-format printers, commercial print service providers, publishers and printers of labels, shrink sleeves, flexible packaging and other specialist printed products, HP has embedded its



environmental proposition into equipment, media and supplies.

The evolution of digital printing has made fundamental changes in the printing process. Digital printing eliminated many stages that were time, energy and resource-consuming and were accompanied by liquid and solid waste and fumes, some of which require specialist treatment for disposal. The use of chemistry for film and plate processing is eliminated with digital print, as is start up substrate waste.

These technical developments have dovetailed with changes in marketing practices that have led all sectors of the printing industry towards shorter turnaround times and shorter run lengths. Digital printing enables these trends as well as just-in-time delivery and stockless supply chains. The environmental impact of this convergence has been enormous: prior to the advent of digital printing, it is estimated that more than 56 percent of all print was thrown away unused.[1]

Clean, efficient technologies in use in HP Indigo presses together with recovery and recycling programmes are enabling efficiencies as well as energy and material savings.

For more information on HP's commitment to the environment please use the following link: http://www.hp.com/go/environment.

HP is ranked as one of the world's most sustainable corporations by The Global 100.

In 2006, HP saved $4.9 million by recycling 87.3 percent of the solid waste generated from its large U.S. sites (compared to landfill or incineration costs).

# HP Imaging and Printing Group (IPG)

## Making the vision a reality

IPG comprises HP's broad range of imaging solutions ranging from HP Deskjet printers for consumers to
5-metre wide HP Scitex industrial inkjet printers. However, across this diverse market there is the same vision and commitment to deliver imaging and printing with a low environmental impact.

**HP IPG's area of operation**

- Consumer: home and home office
- SMB: small and medium businesses
- Enterprises: large organisations and businesses
- Graphic Arts:
  - HP Indigo
  - HP LFP: Designjet and HP Scitex
  - HP Specialty Printing Systems

HP is working to make it easier for imaging and printing customers to use less electricity, to recycle more and reduce their environmental impact.

HP is listed on the Dow-Jones Sustainability and FTSE4Good and Accountability Rating Indices.

To help customers large and small reduce the environmental impact of their imaging and printing operations, HP has built a strategy based on the benefits of:

- Reducing costs
- Saving resources
- Delivering results

In each of these areas, a combination of technology and best practice can help make a difference to the impact that each company and each person has on the environment. While HP IPG's graphic arts constituency includes designers, photographers, technical professionals and commercial and industrial printers, the three key benefits are interests that are shared by all of them.

**Reducing costs**

HP's efficient solutions help its customers reduce the cost of power, waste and asset disposal. "Energy intelligence" that is designed and built into HP printing products means that they run efficiently throughout their lives.

Reducing the cost of waste is a goal achievable through innovative product design, highly automated workflows and the use of print-on-demand solutions. Improving cost-effectiveness by modernising the way customers do business, automating processes and simplifying management tasks through the use of technology are practices being employed already by many HP customers.

Our goal is to make it even easier to access these benefits, which can deliver immediate results to customers and also to those along the supply chain.

A final way that HP helps to reduce costs is by providing easily accessible means of product disposal. HP's Asset Recovery and HP Planet Partners services have collected millions of products for recycling or refurbishment.

In 2008, HP announced it had developed an engineering breakthrough that enables the use of post-consumer recycled plastics in the production of new original HP inkjet print cartridges. Since first piloting the process HP has used enough recycled plastic to fill more than 200 tractor trailers (based on a nominal payload of 44,000 pounds).

**Saving resources**

Our recycling policy represents major savings of resources – metals are reclaimed and plastics are recycled on a scale that continues to grow.

HP has implemented a packaging policy that reduces metal, plastic, paper and cardboard waste materials while continuing to provide product protection and security prior to sale.

Paper recycling is something that just about everyone is aware of, and it's something that everyone can do. At the home and office level, product innovation incorporating features like automatic duplexing, fax-to-computer, and computer-to-fax dramatically cut paper usage.

**HP was named one of the world's 10 corporate "Green Giants" by Fortune Magazine, April 2007.**

At the same time, our colour management technologies ensure that colour accuracy is quickly and reliably achieved, contributing to further paper savings.

In the graphic arts, HP's connectivity and web-to-print technologies cut the number of paper copies needed before proofing. HP Designjet and HP Scitex printers as well as HP Indigo presses generate minimal substrate waste, and, of course, print only the exact number of copies required. This reduction of start-up waste and the possibility of producing one-off items cost-effectively and profitably is one of the most dramatic achievements of digital technology.

**Delivering results**

HP is proving by its own practices that addressing environmental concerns makes good business sense. Many of the steps that can be taken are simple ones, but ones that will deliver immediate and noticeable benefits. For individuals, the savings made can provide personal benefits. For companies, the savings will be bigger, and because they will be built on efficiencies, those benefits can be passed on to customers, making the company more competitive and more profitable.

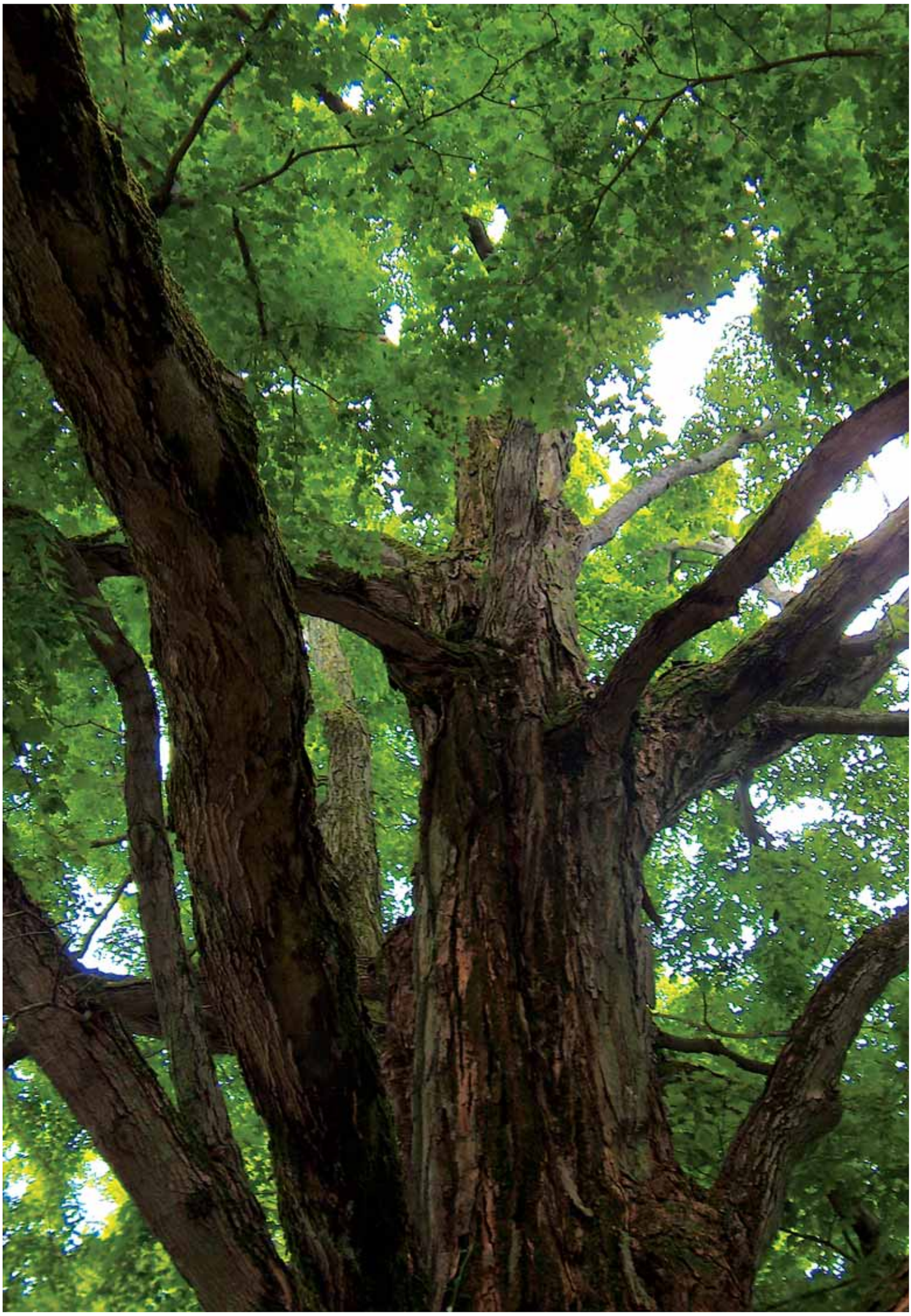
The graphic arts industry has undergone enormous changes in the past twenty years, and there is no question that the introduction of digital technologies has streamlined production workflows and driven growth and profitability.

**HP's commitment**

Our founders put HP's first global citizenship initiatives into place more than 50 years ago. Today, addressing environmental issues is a fundamental part of our culture and heritage.

**Product ranges within IPG include:**

HP Deskjet
HP LaserJet
HP Business Inkjet
HP Officejet
HP Officejet Pro
HP Photosmart
HP Designjet
HP Indigo
HP Scitex (including MacDermid ColorSpan, Inc., products)



In 2007, HP reused 65 million pounds of hardware to be refurbished for resale or donation, increasing its annual reuse rate by 30 percent.

## The conventional heritage

Today when we talk about digital printing and the environment, it is worth noting how much progress has been made since digital printing was launched fifteen years ago. Even then, environmental awareness in the printing industry was growing and steps had been taken to control liquid and solid waste and emissions, recover silver from film processing, and cut the use of chlorine bleach in papermaking.

Still, offset litho production was based on producing films, processing plates and disposing of large volumes of liquid and solid waste. While computer-to-plate technology (and computer-to-flexo for label, shrink sleeve and flexible packaging production) has made conventional analogue printing more efficient, it is not chemical free and there can be significant volumes of start-up waste until the ink and water balance and registration are achieved.

| **Stages in Conventional Printing** | |
|---|---|
| Electronic prepress, replacing: | Editorial and artwork<br>Colour separation<br>Retouching<br>Stripping |
| Film separations | |
| Proofing | |
| Plate exposure | |
| Plate development | |
| Plate mounting | |
| Blanket cleaning | |
| Registration adjustment | |
| Ink/water balance | |
| Print | |
| For perfecting, return to the beginning and start again. | |

## Designed with the environment in mind

With HP Indigo digital printing, waste, time, and consequently, energy, are saved through a number of efficiencies.

Digital printing can be carried out direct from digital artwork files, without the need for intermediary media. While computer-to-plate (CTP) is commonplace in Western Europe and North America, much of the world's offset litho production still uses substantial amounts of film in plate-making. In Western Europe more than 20 million $m^2$ of film were used in 2007[2]. While film and plate processing no longer require the large amount of equipment they once did, there are still issues of waste chemical solution disposal, fume extraction and disposal or storage of the used plates and films, as well as recognised health problems associated with processing silver halide films – e.g., agyria.

While some of the waste, time and cost-savings may now be taken for granted as they have become the basic assumptions in discussions of digital printing, the reality is that digital printing remains a small, if growing, percentage of global print volumes.[3] Digital printing is, however, being increasingly adopted as a complementary technology to conventional production, and it has the advantage of being ideally suited to modern marketing methods as well as further enabling the democratisation of print.

The fact remains that using a digital press instead of a conventional one will have less environmental impact.

**How digital printing supports the environment**

- Reduced paper waste: print only what you need
- Higher returns on fewer pieces: leverage variable data capabilities
- Reduced make-ready and change-over waste

HP has set a goal for 2010 to reduce the combined energy consumption of HP operations and products by 20 percent below 2005 levels.

## Print-buying and the environment

Apart from the benefits made possible through the elimination of film and plate production, savings on substrate and storage costs throughout the supply chain are considerable. When the Indigo E-Print 1000 was launched in 1993, it was estimated that about 56 percent of all print was thrown away unused[1] and as recently as 2003, it was estimated that this figure had fallen to 31 percent.[4] This was a consequence of the focus on 'unit cost' by print buyers and sellers.

The argument went that 1000 copies would cost €750, giving a unit cost of €0.75. However, 2,000 copies would cost only €1,000, cutting the unit cost to €0.50. The perception was that this was a cheaper option. The reality was that the original 1,000 supposedly needed had been rounded up from 650 'to be safe'.

The bottom-line consequence was that less than half were used, the remaining 1,350 copies, in this example, had to be stored until they were eventually thrown away.

There was waste in the production, substrate, storage and all associated logistics.

Digital printing has shifted the focus from unit cost to 'unit value'. Using some of the benefits of digital printing, like variable data printing and the ability to print on a wide variety of substrates, the perceived value of printed products goes up, and in the case of applications like direct mail, new measurements like 'cost per response' can be used.

## How HP Indigo presses support environmentally responsible printing

Printing is an industrial process, but digital printing is a computerised process, which is by nature less demanding of resources and less wasteful than conventional print. Savings due to the changing print market favour digital printing with its streamlined workflow. Run lengths are falling so that a higher proportion of jobs are within the range of cost-effective digital production.

In a report by InfoTrends, 'The Cost of Color Print,'[5] it is estimated that today 69.9 percent of all commercial colour jobs can be printed cost-effectively on digital presses. This brings many jobs into range that would be less efficiently and more wastefully produced if printed conventionally.

With HP Indigo digital technology, further benefits are designed into the presses as part of HP's commitment to providing customers with inventive, high-quality products and services that deliver reduced environmental impact throughout their lifecycles when compared with alternatives.

## Emissions and Waste

Like all printing presses, the operation of an HP Indigo press produces waste and emissions. However, as runs become shorter, the levels of waste and emissions per job become lower compared to conventional printing.

### Waste

Imaging oil is used to dilute HP ElectroInk, which is paste-like in consistency and contained in a tubular cartridge. Normal disposal of oil by a licensed waste hauler is all that is required.

## Customer experience

**Carrick Wilkie, sales development director, Cambrian Printers, UK.**
"Digital printing is better for the environment because it simply creates less waste: fewer chemicals are used in the process and there is little, if any, paper waste. 90 percent of our waste material is recycled and with digital printing the total waste material is noticeably lower. We can print an exact number of copies without any prepress waste at all – for short runs this is both cost-effective and hugely efficient.

"We have actively marketed our business as 'green' for several years and our growing customer base is attracted by our efficient digital printing capabilities. Our HP Indigo press 5000 offers customers high-quality, versatile products while remaining responsible toward the environment and has become an integral part of our business, now responsible for more than 10 percent of our annual turnover.

"Environmental concerns are fundamental to the success and continued development of our business. Cambrian Printers is committed to limiting the impact of print and related processes on the environment and has been actively improving its footprint over the last 10 years.

"As a consequence we have won several awards for our environmental work including 'Environmental Company of the Year' at the PrintWeek Awards 2007 and Winner at the National Recycling Awards 2006 for 'Best Recycling Initiative'. Cambrian is also FSC Chain of Custody, ISO 14001 and ISO 9001 accredited."

The recycling system recently introduced in the HP Indigo press 5500 significantly reduces the consumption of imaging oil compared to the HP Indigo press 5000:

- Imaging oil consumption is reduced by approximately 50 percent
- Total oil waste is reduced by approximately 50 percent

Liquid electrophotographic printing uses imaging oil as a liquid carrier. During the printing process, oil is evaporated from the image. The vapour and ambient air are drawn into the cooler by a blower and the cooler condenses the oil and ambient water vapour into a liquid.

The Oil Recycling System referred to above separates the oil from the water and then ink additives are added to the recycled imaging oil according to need. The recycled oil is fed back to the press ready to be used by the printing process. The water generated during the separation process can be disposed of in a municipal drain.

Additional sources of waste in HP Indigo presses include: Empty ink cartridges, used blankets, used Photo Imaging Plate (PIP), Binary Ink Developer (BID), and cleaning rags.

Under U.S. Federal EPA criteria, none of these waste products is classed as hazardous waste and so they can be disposed of by licensed waste haulers.

**Volatile organic compounds (VOCs)**
During the printing process, volatile organic compounds (VOCs) are released from the inks used in the press. However, none of HP Indigo's inks or other supplies contain substances that are listed on the US Federal list of Hazardous Air Pollutants as established under Section 112 of the Federal Clean Air Act (42 USCA § 7412), or the EU VOC Directive 1999/13 EC.

HP Indigo devotes considerable resources to ensure compliance with current applicable standards and invests in the development of new technologies that deliver environmental improvements.

## Reduce, reuse, recycle

**HP began electronics recycling in the 1980s. Highlights from HP's recycling programmes in 2007 include:**

- In Europe, the Middle East and Africa, HP nearly doubled the amount it recycled over the previous year to 170 million pounds (77,111 metric tonnes) of equipment.
- In the Americas region, HP recycled an estimated 65 million pounds (29,484 metric tonnes) of equipment.
- In the Asia Pacific region, HP recycled 13 million pounds (5,897 metric tonnes) of equipment.

**Ozone**

Ozone exposure levels in the workplace are subject to control and regulation across the world.

HP Indigo presses produce ozone at low levels, generated by the scorotron and charge roller that charges the photoreceptor. In regular operation, ozone peak levels are found to be well below the international occupational health standard of 100ppb for an eight-hour exposure level.

In HP Indigo presses, the ozone is captured by highly efficient charcoal absorber cartridges. The cartridges need to be replaced after one million impressions. Following the manufacturer's advice is essential for health and safety and environmental compliance, and users need to be aware of any special local requirements.

In 2008 HP started trialling an Indigo Recycling Programme in Australia. The pilot scheme is operating on a process where used ink cartridges are collected by the Currie Group (Australian distributor of HP Indigo presses) and transported directly to a recycling facility certified under ISO 14001 standard at zero cost. The programme highlights HP's commitment to achieving environmental sustainability and is available to HP's Indigo commercial and industrial print service providers. It is aiming to convert an estimated 6.2 million tonnes of waste per year into recyclable material within Australia, and if take up is good HP will consider implementing the programme globally.

## HP ElectroInk

HP ElectroInk is the single most recognisable difference between HP Indigo digital printing and all other forms of digital printing. HP ElectroInk comes in cartridges in paste form and is diluted with imaging oil, as discussed previously. A liquid ink in an offset-like process, HP ElectroInk produces the "look and feel of offset" that differentiates it from dry toner digital printing.

**Use in food packaging.** HP ElectroInk 4.0 inks printed on the non-food-contact side of polymeric multilayer food packaging are in compliance with Article 3 of the EU Framework Regulation Nr. 1935/2004 for food contact materials.[6]

The suitability of HP Indigo printed products is enhanced by partner solutions. The DigiLam laminator from A B Graphic International laminates HP Indigo printed flexible packaging materials using a water-based adhesive, increasing their potential for use for food packaging. For other substrates DigiPrime® 4431, is a water-based dispersion from Michelman, Inc. for coating substrates that meets EU food legislation requirements and can be used for food packaging.

**Our goal is to reduce carbon dioxide emissions from HP owned and HP leased facilities worldwide to 15 percent below 2006 levels by 2010.**

The Workplace Transformation program is described in:

**Sustainable buildings** http://www.hp.com/hpinfo/globalcitizenship/gcreport/operations/sustainable.html

**Energy – Operations** http://www.hp.com/hpinfo/globalcitizenship/gcreport/energy/operations.html

## Customer experience


**Richard Gillmore, production manager, Wellcom Brisbane, Wellcom Group Limited.**

Wellcom is a production based solutions company providing specialist services to advertising agencies, corporations, and some of Australia's leading retailers and international brands. Established in 2000 in Melbourne, Wellcom has grown rapidly from a small team to a national network that now employs over 250 staff. In that time Wellcom has publicly listed and expanded its operations into Sydney, Brisbane and Adelaide.

The company uses HP Indigo presses and has an HP Indigo press 5000 at its Brisbane facility. Wellcom is one of the first users of the new HP Indigo Recycling programme.

"Wellcom is very serious about the part we all must play and the impact on our environment. As a combined digital and offset printer we recycle ALL paper," says Richard Gillmore, production manager, Wellcom Brisbane. "Our metal plates and waste chemicals are also picked up and recycled, dual office bins separate the recycle/non-recycle materials, and we are abolishing the harsh chemicals used in our offset area.

"The collection of used HP ElectroInk cartridges is an absolutely fantastic idea. I think suppliers could generate a much larger portion of business if they collect their own waste," he adds. "While the benefits of being an environmentally responsible printer vary from client to client, Wellcom is striving to achieve very high results in recycling and waste management, and encourage our clients to support our vision."

**California Proposition 65.** Although a US law, the California Drinking Water and Toxic Enforcement Act of 1986 (Proposition 65) is widely known outside the state as a landmark in setting high regulatory standards. HP ElectroInk 4.0 products do not contain any substances listed under that act.

**Hazardous Air Pollutants.** As noted above, none of HP Indigo's inks or other supplies contain substances that are listed on the United States federal list of Hazardous Air Pollutants.

**Heavy Metals.** Based on the formulation of our inks and information received from our suppliers, HP ElectroInk inks do not contain lead, cadmium, mercury or hexavalent chromium in a combined concentration exceeding 100 parts per million by weight of the ink in the dry state.

**Facts about HP ElectroInk**

- HP ElectroInk has been awarded the Nordic Swan ecolabel for use on printed matter
- HP ElectroInk complies with the Stockholm Convention on Persistent Organic Pollutants
- HP ElectroInk uses no chemicals requiring Prior Informed Consent under the Rotterdam Convention for use in International Trade
- HP ElectroInk complies with the Montreal Protocol on substances that deplete the ozone layer
- HP ElectroInk is not classified as Dangerous Goods under International Air Transportation Association Regulations

## Putting environmental commitment into practice

HP, Indigo Division's commitment to achieving environmental sustainability can be demonstrated by recent innovations and practices:

- HP is implementing a technology that reduces the energy required for manufacturing HP ElectroInk by 40 percent.
- The HP Indigo press 5500's built-in oil recycling unit enables efficient use of imaging oil.
- Continuous work with media partners has resulted in an expanding range of recycled and environmentally responsibly manufactured papers.
- HP Indigo manufacturing sites are ISO 14001 certified. ISO 14001 is an internationally accepted standard that sets out how organisations can put in place an effective Environmental Management System (EMS).
- Each month, about 40 tonnes of paper printed with HP ElectroInk 4.0 at HP Indigo manufacturing and R&D sites in Israel are sent for recycling. In addition approximately three tonnes per month of cardboard is sent for recycling along with waste oil.
- HP Indigo presses have reduced energy per printed page; 20 - 30 percent from the HP Indigo press 5500 to the new HP Indigo 7000 Digital Press.

These numbers show what can be done and what is being done to ensure fulfilment of HP's commitment to the best environmental manufacturing processes. Basic recycling of paper products, glass, metals, plastics and other now readily reclaimable separated waste is a practice that can be adopted by our customers, as well as by HP.

In its fiscal year 2007, HP recycled nearly 250 million pounds of hardware and print cartridges globally, an increase of approximately 50 percent over the previous year. Did you know that this is equivalent to more than double the weight of the Titanic?

## Helping you to help your customers

Increasingly, companies are under pressure to look at their practices and purchases to ensure they follow environmental guidelines. We have already seen how using HP Indigo presses instead of analogue technology can save resources and energy, and how the waste from them is reduced and can be managed responsibly.

There is another area where the HP Indigo press can demonstrate its green credentials: in its ability to print on recycled paper.

Print service providers (PSPs) are already knowledgeable in the sometimes tangled definitions of what constitutes 'recycled' paper. From an HP Indigo printing perspective, it is important to know that HP Indigo presses can print on more than 1,000 coated, uncoated and specialty substrates from third-party substrate providers all over the world. These papers range in weight from 40g/$m^2$ to 350g/$m^2$, depending on the press type and have been tested and certified by HP Indigo testing centres. Leading paper suppliers have developed their own recycled papers, or papers with environmental credentials, many of which run on HP Indigo presses.

Today, there is an evolutionary change happening in the world of paper and it is easier to identify which companies are taking the measures appropriate to ensure the highest standards.

Fibre conservation, forest stewardship, energy reduction, and clean stream emissions are of high priority to the manufacturers and users of papers. Going beyond the status quo, HP Indigo engages with paper companies in leading the change in big business energy conservation, ethical use of fibres and forestry, and clean water emissions.

Papers with environmental credentials are not restricted to recycled stocks, but a range of classifications enable informed choices.

**HP Indigo Certified Papers feature media that meet these industry standards:**

- Chain of Custody
- Forestry Stewardship Council (FSC)
- Sustainable Forest Initiative (SFI)
- Programme for the Endorsement of Forestry Certification (PEFC)
- Recycled Papers

**Knowing what you are getting**

It is no longer enough simply to accept what one is told about the provenance or content of paper stocks. PSPs and end-users want to be certain that what they are actually receiving is what they want to receive. In the early days of paper recycling, there was much confusion about what "recycled paper" really meant. Other terms like "post-consumer waste," "X percent recycled content," "made from sustainable forests" and so on, were common place and there were no clear legal definitions of recycled paper.

With specific regard to HP Indigo presses, there were many questions about whether they could print on recycled papers, and even whether papers that had been printed on HP Indigo presses could be recycled.

Today, things are much clearer. There are standards and codes of practice that enable PSPs and end-users to have confidence in the papers they use.

**Chain of Custody** certification is one way that PSPs and end-users can be sure that the papers they use are what they claim to be. Chain of Custody certification provides documented evidence of the unbroken path that timber products take from the forest to the consumer. Whenever a company carries out any physical alteration to the timber product, they take legal ownership of it. Chain of Custody certification is required by companies wishing to use the Forest Stewardship Council (FSC) trademark.

## Customer experience

**Joleen Kelley, production manager – dry process printing, District Photo, USA.**

"District Photo has a long-standing commitment to conduct business in an environmentally conscientious manner. We focus on our local community as well as efforts to protect our planet's natural resources.

"For many years we have been an industry leader in our ability to regenerate photo processing chemicals, reusing portions of the chemistry multiple times. We remove contaminants and adjust the PH prior to liquids becoming part of our waste water.

"Plastics, single use cameras, all paper and wood products are recycled. We are committed to an ongoing effort to replace company documents and become "paperless."

"We use HP Indigo digital presses for their reliability and the high-quality capability it demonstrates when reproducing photographic images. We have both HP Indigo press 5000s and HP Indigo press 5500s. The imaging oil recycling process in the HP Indigo press 5500 is a welcome feature and has reduced waste in the digital printing area by half.

"Our technical staff has a comprehensive preventative maintenance schedule with a focus on optimum energy efficiency. Energy consumption is factored into all new equipment purchases as well as new construction and facility refurbishment projects.

"We work closely with our customers' needs when selecting substrates and focus on suppliers that manufacture products in an environmentally friendly way. Over 30 percent of our printing is on substrate manufactured using low chlorine and wind turbine power. Additionally, these companies have forest conservation programmes in place."

The **Forest Stewardship Council** is an international organisation well known in the graphic arts industry. FSC certification has been granted to paper mills, distributors and printers and is widely promoted by conservation advocacy groups worldwide. Earning the right to use the FSC trademark is often a driving force for Chain of Custody system implementation.

The **Sustainable Forestry Initiative** is an independent, non-profit organisation that certifies forestry management and Chain of Custody in North America and Mexico. With some 137 million acres operating under its management principles, the SFI has also trained nearly 100,000 loggers and foresters since 1995. The FSC operates through its network of National Initiatives in 45 countries and its certification is widely recognised. SFI certifications include the "100 percent Certified Content Label" and the "100 percent Recovered Fibre Label" which provide assurance to those seeking papers from sustainable forests, or 100 percent recycled papers.

The **Programme for the Endorsement of Forestry Certification** (PEFC) is an international organisation that facilitates the recognition and co-endorsement of national forest certification systems. The PEFC has members in more than 30 countries and some 200 million hectares of forest has been certified through its national members' programmes.

**Recycled Paper** has been one of the most confusing terms for print-buyers and end-users because of the lack of firm definitions. There are a number of basic principles that can help with understanding and aid buying decisions.

The US Environmental Protection Agency (EPA) has effectively set the guidelines for using the term "recycled paper" by requiring that a minimum of 30 percent of post-consumer content is used for uncoated printing and writing papers, and 10 percent post-consumer content for coated papers. However, many mills offer papers with 100 percent recycled content, comprising both post-consumer and pre-consumer (including mill broke) content.

One of the issues with 100 percent recycled papers has been that when re-processed, the wood fibres are broken so that the resulting paper didn't have the same properties as papers made from virgin pulp. Recent changes in paper-making are reducing the damage to fibres and improving the properties of the finished product. However, the number of cycles a given virgin fibre can undergo is still limited to four or five.

The **HP Indigo Media Eco Guide** is available for HP Indigo press owners from the My HP Indigo portal and provides a list of international paper mills and distributors showing the availability of papers with FSC, SFI, PEFC and recycled content as well as other special energy accreditations.

PSPs and print buyers wishing to use recycled papers need to take a number of factors into consideration because not all recycled papers are suitable for all applications. Questions that might be asked to help decisions include:

- What level of brightness is required for the application?
- Will the product be folded, and what will the level of ink on the folds be (if any)?
- What is the weight of the paper? This is important when considering stocks for direct mail.
- What is the strength of the paper? Will the product require any special durability properties?

## HP Indigo's Environmental Landmarks

1993 First Indigo press was launched, incorporating a system to capture and condense imaging oil vapour components into liquid

2004 The HP Indigo press 5000 was launched, including a mechanism to separate condensed oil from water, reducing overall waste

2007 The HP Indigo press 5500 includes an on-press oil recycling system that reduces overall use of imaging oil by approximately 50 percent

2008 The new HP Indigo 7000 Digital Press is launched, requiring approximately 25 percent less electricity per printed page than its predecessor

## Recycling papers printed on HP Indigo presses

Media printed with HP ElectroInk can be recycled and used for a variety of applications. HP, in conjunction with leading paper research institutes such as Centre Technique du Papiers (CTP) Grenoble, is researching de-inking methods and processes and their applicability to HP Indigo printed media.

As noted previously, HP Indigo's research and development and manufacturing facilities are presently sending 40 tonnes of HP Indigo printed papers for recycling each month.

Deinking is a key initial step in paper recycling where ink is separated from the fibres. The deinking efficiency is evaluated by measuring the residual ink specks in the de-inked and processed pulp in terms of square millimetres per square metre. Brightness is also measured, and compared to a target brightness and purity of the resultant un-printed recycled paper.

Papers printed with HP ElectroInk version 4.0 are recyclable, based on typical two-loop de-inking processes. There has been an improvement in de-inking performance compared to older generation ElectroInk, based on innovations from the Indigo division of HP. The Indigo division continues to fund research on de-inkability by considering not only ElectroInk formulation approaches, but also the influence of paper type, de-inking process variables and scaled-up experiments that model the industrial process more directly.

As previously mentioned, HP ElectroInk has been awarded the Nordic Swan ecolabel, which means that prints produced with HP ElectroInk meet requirements relating to chemicals with which the ink is made. The Nordic Swan was first awarded to HP ElectroInk 3.1, and more recently to HP ElectroInk 4.0.

Neither PSPs nor print-buyers want their customers to have a negative experience of using recycled papers, since it could mean that they never specify them again. Ensuring a positive experience with optimum print quality is, therefore, worth spending some extra time on when dealing with a customer's first request for using recycled paper.

It makes good business sense for a number of reasons:

1. Being seen to be 'green' is high on the agenda of many companies and organisations
2. An increasing number of buying decisions are influenced by factors relating to environmental responsibility
3. There are myriad leadership and business opportunities in being up-to-speed with environmental issues and solutions

HP is working to help its customers reduce their environmental impact across its full portfolio of products.

## HP Indigo digital press portfolio


AMPV = Average Monthly Page Volume (A4 4/0)

## The HP Indigo press range

The versatility and the wide range of applications that can be printed on the HP Indigo press range means that sometimes the features that these presses have in common is overlooked. Yet, what they do have in common is the core technology that uses the same, reliable, HP ElectroInk that can accurately reproduce PANTONE® Colours and print on a wide variety of substrate materials and weights.

HP ElectroInk technology means that a uniformity of services can be delivered to customers regardless of their press type. The same environmental benefits can be found in all HP Indigo presses.

## Key environmental points about HP Indigo presses

- HP ElectroInk 4.0 products do not contain any substance listed under California Proposition 65, which is widely known as a landmark in setting high regulatory standards.
- HP Indigo presses can print on a wide variety of recycled papers and papers with recycled content – coated and uncoated.
- Paper printed on HP Indigo presses can be de-inked and recycled.
- HP Indigo presses are manufactured to ISO 14001 Environmental Management Standards.
- The HP Indigo 7000 Digital Press has been designed to meet RoHS standards.[9]
- HP Indigo presses are designed for safety and certified as safe by leading approvals bodies including UL, ETL and TUV Product Service.
- Used consumables from HP Indigo presses (PIPs, BIDs, blankets, ink cartridges) require only standard disposal by licensed waste haulers.
- HP Indigo presses that are traded-in are disposed of responsibly, reclaiming materials and recycling as appropriate.

From end-to-end, HP Indigo presses offer PSPs and their customers solutions that deliver a high level of environmental integrity and a supporting infrastructure to help safeguard the future.

(1) Interconsult, 1994

(2) Internal HP sources

(3) Internal HP sources estimate the digital share of the global printing market at six percent.

(4) Source: CAPVentures, April 2003

(5) InfoTrends, "The Cost of Color Print," October 16, 2006

(6) March 27, 2007, Assessment of Electroink 4.0 by Fraunhofer Institut, Verfahrenstechnik und Verpackung.

(7) RoHS stands for "the restriction of the use of certain hazardous substances in electrical and electronic equipment".

## To learn more, visit www.hp.com



This is an HP Indigo digital print.

Printed on Satimat Green 60 percent recycled/40 percent FSC virgin fibres – Arjo Wiggins



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