

SUSTAINABLE GRAPHIC DESIGN SOLUTIONS FOR CERN

FABIENNE LANDUA (IR_ECO_ECP)

23 November 2022

.....

Sustainable graphic design (SGD) refers to the design process that integrates an environmentally friendly approach and considers natural resources as part of the design.

SGD has gained increasing attention over the last years. It is to be understood as a process, where the focus is not on the 100% sustainable product, but on the gradual improvement of existing products and processes.

Many companies have realised that their communication should have an ecological focus. They put forward ethical branding, sustainability, corporate responsibility. When companies claim to be eco-friendly based on a myopic view of sustainability and without looking at all the implications of their actions, they may end up being accused of “greenwashing”. Greenwashing is the practice of making an unsubstantiated

or misleading claim about the sustainable benefits of a product, service, technology or company practice. Greenwashing can make a company appear to be more socially and environmentally friendly than it really is. For example, this could concern the practice of “spinning” their products and policies as environmentally friendly, by presenting cost cuts as representative reductions in the use of environmental resources. Sustainable practices need to be authentic. If they are not, companies risk losing all credibility.

Several articles, videos, online courses and websites (see references provided at the end of this document) highlight different aspects of SGD. The following chapter lists a number of essential recommendations for graphic designers and background information regarding important choices to consider, notably for the printing process.

.....

RECOMMENDATIONS FOR SUSTAINABLE GRAPHIC DESIGN

1) Lifecycle analysis and choice of medium:

The SGD process should start from the end rather than the beginning: namely, how things get produced and consumed, while also considering the supply chain. It should integrate an environmentally friendly approach and consider choosing natural resources. The choice of the medium is therefore essential: is a print product necessary, or are digital media (emails, e-books, digital advertisement) more suitable?

2) Layout and scope of print

Two issues are important to consider when it comes to printing: reducing the amount of paper waste and the use of ink.

Reduce paper waste by

- a final format that makes the best use of the spreads,
- using lighter paper and two-sided printing,
- using standard formats (DIN A4, A5, A6) - “original” formats generate unusable paper scraps,
- using the smallest format that fulfils its purpose,
- printing only as many copies as are needed,
- opting for digital printing for low volume printing (e.g., less than 2000 copies) when the content needs to be changed often.



Reduce the use of ink by

- avoiding fill colours in design bleed,
- increased use of white space and by keeping the bleed white, when possible,
- limiting the number and amount of colours,
- avoiding metallic or neon colours, glossy varnishes and foils in decorative printing,
- choosing die-cutting or blind embossing as more eco-friendly alternatives.

3) Durable design

Durable design of high-quality and re-usable printed matter is particularly important for signage, exhibitions, and branding of events:

- apply brand plates, way-finding signs and signage only where they are necessary for orientation,
- manage the size, the choice of material and the life span of signage,
- avoid placement of print products with a short lifespan which cannot be reused or recycled (for event signage, there is an omnipresence of ephemeral materials (e.g., plastic banners) which are often wasted as not recyclable),
- avoid plastic packaging and plastic material for physical objects (e.g., sold in the CERN shop), Source materials should be renewable and recyclable, produced with minimal use of energy and material for their production, opting for/choosing renewable materials where possible.

4) Digital printing

Digital printing is considered the most environmentally friendly option for runs of less than 2000 pieces. It also works well for larger jobs such as signs or banners. Digital printing also saves time-consuming cleaning work of the printing machines.

The environment benefits afforded by laser printers are to be considered, given that the toner inks used therein contain no alcohol nor emit any volatile organic compounds. Inkjet printing hardly produces any gases. Many manufacturers nowadays recuperate empty toner cartridges and other waste (such as printer parts and old ink containers) for recycling.

Further, there are new environmental papers adapted to inkjet printing, for normal printers and even for large format ones.

5) Choice of the printing house

Graphic designers should work with local service providers who care about social responsibility and environmentally friendly printing techniques, with certifications to support their commitment e.g., by the Imprim'Vert label. This supports local companies and minimises transport.

Eco-friendly printers should offer:

- paper made from recycled consumer waste and FSC- or PEFC-certified virgin fibre,
- environmentally friendly paints and cleaning agents with little or no volatile organic compounds,
- services such as offset lithography, waterless lithography, digital printing,
- water-based, chlorine-free adhesives and coatings,
- safe waste disposal for paper and chemicals,
- efficient use of materials and energy saving measures.

6) Digital media: web, social media, videos

Designing digital media applications for web and devices should consider minimising the use of electricity sources and CPU processing. For example, Apple stopped the support of Adobe Flash for animation on its mobile devices

to avoid the massive consumption of battery and CPU calculations produced by the Adobe Flash Player. The recommendations in this context are therefore:

- avoid big attachments in favour of collaborative documents,
- reduce mail banners to the strict minimum,
- avoid e-mail signatures, including the company logo,
- reduce image quantity, resolution and quality without impacting the user experience,
- in web applications, offer images of different resolution and format, based on device size,
- prefer SVG format,
- optimise videos to be as brief, low resolution and compressed as possible,
- disable auto play to save bandwidth for uninterested users.

7) Promoting environmentally aware behaviours in the workplace

Graphic designers should be made aware and encouraged to adopt sustainable printing and energy-saving behaviours:

- Rely on renewable energy sources and energy-saving lamps.
- Minimise the use of printers: only print documents when necessary.
- Check proofs on the screen to avoid unnecessary printouts.
- Ensure the paper used in office printers is of sustainable specifications (see point 5: paper made from recycled consumer waste and FSC- or PEFC-certified virgin fibre).
- aim to (re-)use existing objects, materials.

8) Knowledge exchange

- Pass on your knowledge and experience about sustainable design and print production.
- As far as possible, opt for digital collaboration without printouts, handwritten copies, or stacks of paper versions.

9) Messaging focused on sustainability and ethical branding

Graphic designers should be attentive to messaging that is honest, close to home, and simple. They should avoid making use of 'cliché stock images': many stock photos on 'sustainability' are a collection of light bulbs, water droplets and hands holding trees or clutching a little planet.

Corporate messaging should avoid any 'greenwashing' - always ensure it is factual and transparent, without overpromising or overcommitting.

Graphic designers can inform customers about sustainable options and environmentally friendly production. This can encourage them to be made aware of and therefore adopt a sustainable approach and integrate a recycling logo and other certificates on the product.

BACKGROUND INFORMATION ON PRINTING

1) Paper & material choices

The production of paper from wood needs fuel, water, energy and steel for different machines. Producing one metric tonne of paper requires on average 34.8 million kJ. It is a common misconception that planting new trees saves forests. Millions of new trees are planted each year, exceeding the number of trees cut down for industry. But these plantings cannot be compared with natural forests that have been growing for centuries and feature complete ecosystems in which every phase of life of trees can be found and where the associated biodiversity of other plants and animals can thrive.

The goal of SGD is to optimise the use of sustainable, recyclable and environmentally friendly materials, considering that 75 percent of all printed matter ends up in as waste each year. There are two main criteria to be considered, namely the origin of the paper and its bleaching process.

Origin:

FSC-certified paper: The Forest Stewardship Council is the world’s most recognised body for the international certification of wood. It certifies sustainably sourced virgin fibre and mixed recycled materials. The use of the FSC logo requires to follow the FSC chain from the certified forest to the paper mill, dealer and printer with an FSC certificate.

PEFC-certified paper: The Programme for the Endorsement of Forest Certification (PEFC) is similar to the FSC system. It is an international non-profit organisation that promotes sustainable forest management and tracks timber from its origin forest, allowing companies to make accurate and verifiable claims about its timber materials. It is considered the certification system of choice for small forest owners.

Recycled paper reduces the consumption of forest resources. Pure recycled paper can be more expensive because collecting and processing wastepaper is expensive and there is strong demand for it. Paper made with 20-40 percent post-consumer waste from recycling and the rest from virgin fibre from FSC-certified sustainable forests can be the most cost-effective solution.

Wood-free paper consists of agricultural residues (coffee, bananas, wheat, rice), other fibers and, more recently, minerals and plastic. Wood-free products are not necessarily and inherently more environmentally friendly. Wood-free paper is usually more expensive, only available in small quantities and difficult to produce because the mills have to be redesigned or re-equipped to accommodate the new paper-making materials.

Treatment:

Chlorine is used for bleaching, so that paper turns white, and the lignin disappears. This naturally occurring substance turns yellow when exposed to sunlight, as can be seen with old newspapers. Two other processes (TCF and PCF) rely on more environmentally friendly substances such as oxygen, ozone or hydrogen peroxide for bleaching.

TCF (totally chlorine free) paper is bleached entirely without chlorine or is even unbleached. The TCF seal applies to fresh fibres. No pulp is used that has been bleached with chlorine or chlorine-containing compounds.

Process Chlorine Free (PCF) paper is bleached without chlorine or chlorine compounds during recycling. However, the starting product may have been bleached with chlorine, so the paper is not necessarily chlorine-free.

2) Inks and colours

The use of inks, solvents, paints and detergents in offset printing causes the emission of volatile organic compounds (VOC). These are harmful to health and are one of the main causes of the ozone concentration in the lower atmosphere. They mix with vehicle exhaust emissions to form photochemical smog. Further, inks can contain toxic heavy metals such as barium, cadmium and lead.

Before wastepaper can be recycled, ink, glue and other contaminants must be removed. The safe separation and disposal of printing ink waste is a major environmental problem. The sludge from ink removal can form ozone with other materials.

However, there are now recyclable ink materials and products such as paints, solvents and cleaners that emit little to no volatile organic compounds. Mineral oil-free, low-emission organic inks can be used in print production, which can be extracted again during recycling.

3) Waterless printing

Waterless printing offers numerous advantages over other environmentally friendly offset printing processes. Conventional offset printing requires water and dampening solutions. With waterless printing the ink is transferred to the substrate within a certain temperature range. Eliminating the use of water and fountain solutions containing

isopropyl or substitutes reduces water consumption and emissions of volatile organic compounds.

Waterless printing is also more efficient. Print shops that have switched to this printing mode have been able to increase their productivity by more than 100 percent. Waterless printing is inexpensive and anything that is possible to print with traditional offset printing can be printed this way.

REFERENCES

- re-nourish.org
- An excellent website for learning about sustainable graphic design. It provides an overview about Systems Thinking, Design Strategies, Tools and case studies from the real world. The “Tools” section contains a project calculator to maximise efficiency on any print project, reducing the environmental impact and saving money by using less paper.
- www.designorate.com/sustainable-graphic-design
- The “Designorate” website gives an overview about the principles of sustainable graphic design.
- The Graphic Design Reference & Specification Book: Poppy Evans, Aaris Sherin, Irina Lee; Rockport Publishers, 2013
- FSC: fsc.org
- PEFC: www.pefc.org
- Sustainable graphic design: Peter Claver Fine; Bloomsbury, 2016
- ecobranding-design.com
- manoverboard.com
- www.credit-suisse.com/about-us/en/reports-research/annual-reports.html
- Annual report of Credit Suisse in digital form
- www.lionbridge.com/fr/blog/translation-localization/annual-reports-why-go-digital
- Arguments for the digital publishing of a company’s annual report
- brand.airbus.com/en/our-brand/eco-responsible-branding
- Sustainable graphic design report from Airbus

This paper can be found: <https://design-guidelines.web.cern.ch>