

This Eco design guide for graphic designers has been prepared by the Centre for Design @ RMIT University & provides a rough guide to reducing the environmental impacts of the design & publishing of documents. The information provided here is intended as a guide only & is designed to be used by: project managers, graphic designers, & desktop publishers as a reference to reducing the environmental impacts of their design.

There is also an eco design quick guide that accompanies this document.

Why eco design?

All products & services have some impact on the environment. This may occur throughout the product's life cycle, from the sourcing of raw materials to manufacturing, distribution, use & disposal @ the end of life. Many environmental impacts are not clearly apparent during the use, making it difficult to identify them. This is why it is very important to analysis the hole of life implications so that the most effective way to reduce environmental impacts can be identified.

The design, printing & transportation of publications involves the use of paper, inks, solvents, & in many cases plastic or paper wrappers for packaging purposes. Energy & resources are used in the manufacture of these products resulting in the release of greenhouse gases that contribute to climate change¹.

All of these stages have an impact on the environment, including increasing the carbon footprint of the organisation requiring the printing. One of the biggest environmental impact associated with the graphic design industry is the use of paper. Anyway that paper usage can be reduced, is positive for the environment.

The design & printing of documents generates a wide range of environmental impacts including:

- 1. The use of paper based products that are often from virgin fibre sources & from non-sustainably managed forests;***
- 2. The use of energy & water for the printing process;***
- 3. The emission of volatile organic compounds (VOC's), which are contained in inks & glues (during use VOC's are emitted into the atmosphere & contribute to climate change);***
- 4. The use of paper & plastic packaging; & 5. Transportation of good to market; 6. The generation of large quantities of waste.***

1. Identify the design or decision stage that you have influence over Perhaps you are the brief setter or you are deciding on the layout of the document, or the type of printing, each design stage has the potential to contribute to environmental impacts.

2. Go through the design considerations of the design or decision stage that you are responsible for & identify actions you can take In some cases this will involve many aspects of the design process & in others it might just be one stage, it is important to be aware of the potential impacts associated with the different stages of the design process & be aware of ways to reduce these impacts.

3. Endeavour to incorporate as many of the design considerations as possible Highlight the considerations that you can employ to reduce your designs impacts

4. Communicate your eco design considerations to your client so that they are aware of your design decisions Design Stage Design Considerations Dematerialise your design. How can you use less material & achieve the same outcome?. Can you downsize your design?. Who is the audience & how will they need to use the product? Do you even need to print it or can you provide it in another format (such as electronically)? Reduce the impacts through good design. Determine the key factors that are required to produce the design & then look @ ways of minimising impacts in each of these areas. Can and/or should the piece be enhanced or made multifunctional?

For example the use of a postcard rather than a letter & envelope. Save paper. Consider the paper that you will use when designing. What percentage of recycled paper content can be used? Always start @ 100% post consumer waste recycled paper content. Minimize energy consumption. In order to reduce the amount of energy used in the production of your product, consider steps or stages that can be reduced such as the number of pages or selection of colours used Extend your products life. What is the lifespan of the selected publication? If it is a short lived product how can you reduce its impacts & make sure that it will be recycled @ the end of its life?. Consider if the product even needs to be printed?. How can you increase the lifespan of your product? Can you include something that extends its life such as a calendar or something else usable

What are the end of life options for this product? How can you reduce or minimize the product ending up in landfill? Design for updateability. If your product is likely to be around for some time, design it to be updateable as opposed to single use Design brief & concept development Communicate your design decisions.

Communication is paramount to success.

¹ Climate change is the term used to describe the altering of global weather patterns as a result of the accumulation of greenhouse gases in the atmosphere from human activity. It is also referred to as 'global warming' or the 'greenhouse effect'. Prepared by Leyla Acaroglu, Research Consultant, RMIT University, Centre for Design 2008 www.cfd.rmit.edu.au

Explain & Educate

Explain the social, environmental & economical advantages of employing these strategies to your clients & consumers. Include a recycled logo & emphasise the eco-design strategies used in the project.

Educate the client & encourage them to do the same. Specify the functional & environmental characteristics of your paper on your reports & publications. This may include the inks used in printing, FSC certified stock etc. Advise how the life span of the publication can be elongated, by reuse, archiving etc.. Communicate your beliefs to the client by including messages in emails. & imbedded documents indicating your preference for printing. Try suggesting double sided or four to a page printing



Stage Design Considerations -Typesetting

Condense the space between words, incorporate denser spacing as part of the design, fit into restricted spaces & tie up words hanging out alone: try 0.4pt. Don't overdo the heading size: try 20 – 25 for main title, 15 for section headings & 12 for subsections. Alternatively try using different font types in smaller sizes as headings to make them stand out. Keep spacing between sentences to a minimum: try 1-1.5pt Text & fonts Fonts. Choose font types which are legible whether published onscreen or designed to print: try Serif fonts for printed works & San Serif for online work (easier to read @ 72 dots per inch). Design using smaller font size: try keeping reports & documents to font size 10, whilst minimising business card & book font to sizes 8-10 Design Stage Design Considerations Less is more – reduce the amount of colour. Minimize the number of colours used in a design, remembering that the inappropriate use of colour can be disastrous to the application from a graphic/visual perspective.. Consolidating the use of colour to black, not multiple colours which make up black.

Aesthetic style can be optimised to include environmental options Save paper, reduce white space. Avoid the use of blank space, whilst keeping the layout legible & well designed. Reduce the page header & footers to an appropriate amount for your presentation. Avoid blank pages by trying alternatives such as having the contents on the front page under the heading.

Page bleeds- how they may affect recycling. Don't bleed all the way to the edge (when possible) Avoid spaces between headings & block text. (remember aesthetics though*) Always use both sides of the paper Layout. Consider sheet size & dimensions. Can a smaller size be used to achieve the same quality design & save paper?.*

Consider legibility & length of lines, consider breaking up the document into 2-3 columns, if lines of text exceed 100mm. Minimize the use of paper by minimising spaces in conjunction with the use of suitable margins: try 0.5cm on either side. Designing to multiples of four pages, to reduce impacts of different binding techniques Design size, layout & formats Tables. When formatting tables; always set your font to 2 points smaller than onscreen font. Use sufficient spacing around the table & larger spacing within the table Design.

Design for monochrome, then add colour if absolutely necessary. Avoid using block colours as these require much more ink to produce.

Consider making maximum visual effect with the least amount of ink & colour. Colours Try alternatives techniques to colour. Try not using colour @ all & use alternative techniques. Try using one colour & making advantage of the negative space between the colour, but still being conscious not to waste paper. Consider using a coloured paper (died with vegetable inks) instead of using inks in the printing process Design Stage Design Considerations Minimize waste. Reduce waste by making sure that the job has been proofed extremely carefully. Reduce the risk of a re-print or a job being pulled off the press halfway through Proofing work Reduce the need to print, save paper. Facilitate the editing & proofing onscreen & off paper. Send information via alternatives such as email, CD or USB stick.. Don't print it where applicable (see case study 2 for a comparison of these alternatives). When making a PDF document set it up to automatically print two to a page & double sided. Promote electronic distribution & advertising or consider a combination of both Design Stage Design Considerations Only print what is needed. Assess your job, with distribution & audience in mind & only do what is absolutely necessary. Reduce waste by only printing what you need or consider doing smaller print runs.. Consider sending to smaller solicitations, yet a more effective audience;

••• Design to use all the paper specified & **minimize printers' off cut waste.**

Reduce impacts through aesthetics

Consider the lifespan & print @ the appropriate time

so as to avoid over advertising).

For smaller runs try sharing print runs. Some Australian companies are now offering this service for smaller runs Get your printer on board. Book time with your printer, & communicate quantities & paper well in advance to stop emergency transport of materials,(especially if buying special order recycled paper).

Use a printer that has certifications or ask your printer to get them. These can include FSC, ISO 14001, EPA & EMS, waterless? Design Stage Design Considerations Reduce waste through layout.

When designing, always consider how your web pages will print out. Always provide a printable version of a page. Avoid using white text on a black page Designing for the Internet Reduce the need to print. Make you website easy to read off screen by selecting slightly larger fonts & clear images, this will avoid users printing information. Provide PDF versions of documents instead of having lots of text on a web page Decision making Good decisions are vital in achieving environmental benefits. From the selection of paper to the layout approach & printing process, to packaging & transportation, every decision affects environmental impacts. This section is broken up into each decision making stage & provides design considerations to reduce environmental impacts. Decision stage Design Considerations Reduce impacts through paper selection. When selecting paper for print ensure to check where it has been sourced. Do not purchase paper sourced from virgin forest (especially native forests), although plantation forests can be considered somewhat more sustainable than the latter. Always use recycled content papers. Use high post consumer recycled paper as this maximizes the overall environmental gains from recycling & encourages maximum usage of the paper in it's previous life It also saves approximately 17 trees, per one tonne of recycled post consumer paper. Consider the use of recycled paper stock that has not been de-inked, as this is an energy expensive process resulting in toxic waste ink Always use certified stock. Ask for FSC certified (Forest Stewardship Council), an independent system which ensures imported & domestic paper is validated & monitored from the forest to the final product. Paper weight. Consider paper weight (gsm), the heavier the fibre, the more energy is used in manufacture & transportation Selecting Paper Coatings. Consider whether plastic or wax coatings are used or whether they are necessary. Avoid glossy papers as these have to have extra treatment. Preference

Use water based inks, which are the most environmentally friendly. a standard business document uses a rather low 3 to 5% ink coverage, so keep documents formatted in a business like manner, to save on block ink, VOC's & improve biodegradability because of the absence of heavy metals. Preference water or vegetable based inks Be conservative when using colour & coatings. Consider what you want to gain from using coloured ink?. Reduce coatings by deciding if they are necessary & if so the choices & their varying impact: aqueous varnish, UV cured or varnished (which is best?). In colour must be used restrict to the use of two colours. Use shades of one colour to minimize the amount of colours used. Consider embossing or other non-colour techniques Reduce the VOC emissions. Avoid metallic colours & fluorescent inks which contain (toxic colours). Reduce use of solvents to minimize VOC emissions – look for substitutes. Ask your printer to consider the installation of automatic cleaning equipment, also reducing VOC's Ink selection Reduce waste. Make sure that your printer disposes of there ink & its containers according to EPA guidelines. Avoid bleeds off the page, think about your format as this will influence the bleeds as well. Ask your printer to consider purchasing inks that come in

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**Decision Stage Design Considerations
Reduce Ink Usage**

environmentally sensitive packaging such as ink in a box. Used recycled ink wherever possible. Ensure ink is used on the publication & not on off cuts, to enable ease of recycling Decision stage Design Considerations Encourage recycling.

Make sure that your printer recycles all waste paper from the printing process. Avoid designing so your inks run off the page as this contaminates the extra paper stock making it harder to recycle Try alternatives. Choosing a method such as embossing or die cutting to optimise the design & design for sustainability. Look for alternative binding & packaging techniques Post Press Avoid hazardous processes. Avoid operations such as foil stamping & thermography. Use aqueous sealers, which are not oil based & contain no solvents, with almost instant drying time. Make sure your printer uses non toxic cleaners for the machinery Decision stage Design Considerations Make it easy to recycle or reuse. Preference staples as these come out in the recycling processes & sue the least resources. Use water based glues for binding & labels to avoid VOC's. When binding select wire stitching as staples can be easily removed during the recycling process & then recycled themselves.. Comb & zip binding allow the binder to be reused once the publications life is over. Assembly & disassembly are simple to perform. Binding Reduce impacts. Avoid plastic lamination unless it is necessary to prolong the life of a document, poster or display, as laminating prevents recycling @ end of life.

Use aqueous sealers, which are not oil based & contain no solvents, with almost instant drying time. Avoid over use of perfect bound or spiral bound spines as they are difficult to recycle due to the glues & metals, impeding upon cost effective recycling. Use a high grade paper for the cover, rather than card (for report covers, etc). Decision stage Design Considerations Save resources reduce packaging. Consider the total weight per unit product & how to minimize this (consider GSM per piece of paper, etc). Reduce the amount of packaging to use less material where appropriate. Do not individually packaging items Preference low impact materials. Plastics that can be recycled in general waste stream (up to number 5) are ok to be used. When using paper always make sure that it is recycled non bleached stock Packaging Make sure your packaging can be recycled. Can the packaging be recycled locally? If so make sure that it is recycled. Avoid the use of unrecyable packaging such as plastics over number 5. Select packaging that can be reused in some way

Make sure that packaging is clearly labelled with the recycling options & encourage users to do so...

Encourage the supplier to take back the packaging Reduce waste. If goods must be packaged, package in bulk to reduce wastage. Avoid self adhesive labels where possible. If using them select removable aqueous emulsions. Print mailing information directly onto envelopes or brochures or consider self folding envelopes Decision stage Design Considerations Reduce CO2 emissions consider where your document is printed. Print the publication locally to avoid transportation emissions How will your document be delivered to you?. Maximize deliveries & accumulate goods. Print in bulk lots so that delivery is minimized. Be knowledgeable in terms of distance & make suitable vehicle choices regarding delivery. Can you package the product yourself to avoid courier companies from adding unnecessary bulk Consider how your document is delivered to the consumer. Opt to send publications by general postal service, rather than with a courier. Send publications online or via CD/USB (PDF) to avoid C02 emissions Transportation Considerations Preference locally sourced goods. Request that your printer sources goods locally to reduce CO2 emissions from goods used in the printing process & Cardboard,.

SOURCES

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