

The FIPP/FAEP Handbook on

Magazines and the Environment

Prepared for the International Federation of the Periodical Press (FIPP)
and the European Federation of Magazine Publishers (FAEP)



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ACKNOWLEDGEMENTS PAGE

The author gratefully acknowledges the help received for this handbook from the Editorial Committee: Matti Ahtomies, Sally Cartwright, Richard Henchley, Don Kummerfeld, and Max von Abendroth; from the members of the European Federation of Magazine Publishers (FAEP) and the Periodical Publishers Association (PPA) Environmental Committees and from all those helpful and knowledgeable people in the various professional bodies for the printing and paper industries and in individual print and paper companies – I can't list you all, but thank you.

In a work trying to summarise and simplify such a broad area there are inevitably gaps in content. This is the nature of such a handbook and not a reflection upon those who contributed information.

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INTRODUCTION

Magazine publishing, like all business, has an impact on the environment. However, in many ways it has the potential to be one of the most self-sustaining and environmentally sound of industries, because its main resource (paper) is both made from renewable resources and recyclable. This Handbook, produced by the International Federation of the Periodical Press (FIPP) and the European Federation of Magazine Publishers (FAEP), attempts to set out clearly the areas of current and possible future concerns, and actions that can be taken to address them.

Recognising that environmental issues are complex, and that most publishers are not environmental experts, FIPP, FAEP and the Magazine Publishers of America (MPA), co-sponsored the first edition of *Magazines and the Environment* in 1998. But the issues and technology are changing rapidly, and publishers need to be aware of these new developments so that they can make informed decisions to deal with the concerns of readers, campaigns from outside pressure groups, and the increasing probability of government regulation in many parts of the world. It is hoped that this new edition will provide both factual knowledge and help in making good judgement on these matters.

By being aware of the issues, sometimes by taking voluntary action ahead of pressure, publishers can ensure that their businesses remain, as far as possible, unhampered by legislators and pressure groups. It is not always wise simply to comply with the legal minimum, and many forward-thinking publishers already go far beyond this, but to look ahead and understand the changing climate (both real and metaphorical).

Raising our environmental standards does not always mean increased cost, and indeed has the potential to enhance the bottom line. We are in a business where we can easily convey to our buyers the improvements that we make, and how they too can help by recycling their magazines once read. We need to make them aware that ink on paper remains an environmentally friendly means of conveying information and entertainment. We are dealing now with the first generation that looks automatically to electronic media for much of this, instead of to us, and it may be vital to all our future business that we make sure that magazines remain a socially acceptable, indeed environmentally sound, purchase.

Everyone who has been involved in the production of *Magazines and the Environment* hopes that it will help to achieve this.



Sally Cartwright
Chairman, FIPP Environmental Committee



FIPP/FAEP ENVIRONMENT POSITION PAPER

Magazine publishers around the world recognise that, like all activities, the publishing of magazines has an effect on the environment, and that they need to act responsibly. Although magazine publishers are making good progress in this, they need to address the fact that environmental awareness of every aspect of our lives is growing.

This is the second edition of the magazine industry's Position Paper on the Environment, and reflects the many changes, both technical and attitudinal, which have taken place in recent years.

AIMS

1. Recognising collective responsibility

- All publishers, paper producers, wholesalers, retailers, the printing industry, local and national administrations, ministries and consumers should work together, as environmental concerns impinge on everyone.
- The paper manufacturing, printing and publishing industries should work together to solve present and anticipated problems on a voluntary and co-operative basis.
- Publishers should use their titles to inform readers about the role of magazines in the waste stream, as a valuable source of recoverable fibre.
- Paper producers should be strongly encouraged to employ the best practices of sustainable forest management and environmentally-sound paper production, leading to the supply of a wide range of environmentally sound magazine papers at cost-effective prices. Publishers should ensure that the paper they purchase comes from a paper producer progressing towards these best practices.
- Distributors and wholesalers should ensure that unsold magazines are disposed of responsibly and securely, wherever possible into a recovery scheme.
- Printers should ensure that their processes are as environmentally-sound as possible, with particular regard to discharges.
- Consumers should be encouraged to recycle their magazines, which form an important part of the waste paper stream.
- Local and national administrations, and businesses, should organise collections or local sortation bins and encourage charity/voluntary collections in those countries where such systems exist.

2. SETTING GOALS

- Proposed solutions to the paper waste management issue should focus on setting achievable goals rather than mandating specific solutions. Programmes should define goals and provide initiative for action as opposed to setting specific actions to achieve the goals. This principle should apply both to industries and to local and national administrations.

3. SEEKING REASONABLE SOLUTIONS

- The responsibility for taking action must be kept consistent with the capacity to take action. Proposed paper waste management programmes should demonstrate clearly that the value of benefits to be gained exceeds the cost of implementing and administering the programme designed to produce those benefits. Attention should be paid to the whole environmental balance, both economic and environmental aspects, when planning any actions.

4. MANAGING THE WASTE STREAM

- Recycling should be understood as one method of managing the waste stream, not as an end in itself. Recycling is only one of several paper waste management techniques. Others include, for example, waste-to-energy incineration, composting and even landfill where appropriate. A combination of these techniques in an integrated and coherent programme is the most effective way to manage paper in the solid waste stream. The best choice and combinations of techniques will depend upon the existing local resources.

5. INFORMING AND EDUCATING THE PUBLIC

- Publishers and their associations should encourage the dissemination of accurate information about the value and nature of paper products, about magazine recycling and about collective responsibility. The public needs to be educated about the diverse nature of paper products and the fact that they are not all equally suited to recycling and fibre recovery in an economic manner. It is also important to understand that different types of paper differ in their ability to use recovered fibre without sacrificing essential quality characteristics. Publishers should work diligently to increase recovery of their used magazines, as far as possible ensuring their further use in appropriate recycling and/or energy recovery schemes.

6. MAINTAINING SELF-REGULATION

- Legal measures to deal with waste paper could have a profoundly adverse effect on the print media. Self-regulation and co-operation in this area should be encouraged as the best way to find successful solutions for all parties concerned. Publishers oppose any plans for mandating a specific proportion of recycled fibre content in magazine papers as being impractical in terms of maintenance of quality, and inappropriate in that there are more suitable uses for recycled fibre. Magazines also represent an easily identifiable entry point into the paper chain for virgin fibre – a continuing and absolute necessity.

7. ENCOURAGING NEW TECHNOLOGY

- Care should be exercised to ensure that any proposed solutions for paper waste management do not “lock in ” existing technologies and thus preclude or exclude newer and more efficient technologies.

8. CONCERN ABOUT DISTRIBUTION

- The way distribution and packaging affect the paper stream should remain a concern when considering the magazine industry and environmental issues. Every effort should be made to minimise unsold copies generally, and to ensure that all unsold magazines are recovered for recycling or other re-use.

9. RESPECTING INTERNATIONAL GUIDELINES

- Differing national and regional environmental guidelines affecting paper products should not distort normal market forces upstream and downstream of the market. Waste paper products should not be exported in a manner that destroys or undermines existing paper collection activities in importing countries. While there are very good national standards being developed, as far as possible, international guidelines should supercede national, regional and local guidelines, for example in the certification of forest products.

WHAT IS SUSTAINABLE DEVELOPMENT?

Sustainable development has many detailed definitions. The most commonly used definition originated in 1987. The World Commission on Environment and Development, chaired by Mrs. Gro Harlem Brundtland, the Prime Minister of Norway, published a report called 'Our Common Future' (The Brundtland Report) which brought the concept onto the international agenda. The definition used in this report was 'development which meets the needs of the present without compromising the ability of future generations to meet their own needs'.

WHERE DO ENVIRONMENTAL CONCERNS FIT INTO THIS?

Sustainable development addresses what is known as the 'triple bottom line' - environmental, social and economic performance. Many businesses start off by addressing environmental issues, and then moving on to social issues.

WHAT DOES SUSTAINABLE DEVELOPMENT HAVE TO DO WITH MAGAZINES?

Print and paper is an industry that has been described by Jonathan Porritt, programme director of Forum for the Future and the Chairman of the UK Sustainable Development Commission, as having 'real potential for sustainable development'¹. The main resources used are either from renewable sources, or are recyclable or both - such as paper, for example. Magazines themselves can contribute to sustainable development as they are powerful influencers and beneficial to improving literacy and to learning.

Two of the reasons why the industry is looking at what can be done to realise its potential for sustainability are:

- To ensure future supplies. Managing resources well will ensure that there is always sufficient energy and water to run the mills, presses and delivery vehicles, and raw material to provide paper, plates, inks and chemicals.
- To ensure a 'licence to operate'. By proactively demonstrating the responsibility of the industry, it can reduce potential risk arising from negative perceptions

Additional benefits might include avoiding targeting by environmental campaigners, being seen as a lower risk by investors and insurers (the costs to a business of action by environmental campaigners can be high, and is a consideration within business risk analyses) and protecting advertising revenue.

WHAT IS SUSTAINABLE CONSUMPTION?

Sustainable consumption involves giving preference to renewable resources - those that grow or regenerate - and using them no faster than they can be renewed, and being sparing of non-renewable resources (such as minerals).

Climate change is also connected to sustainable consumption - reducing emissions by either reducing energy consumption or by choosing energy generated from 'renewables'. Across many countries, publishers, printers and papermakers are subject to legislation aimed at reducing greenhouse gas emissions. And while USA has not signed up to the Kyoto Protocol, many American states and industries have set their own targets for carbon dioxide emission reduction.

¹Green Futures magazine

WHAT IS RESOURCE EFFICIENCY?

This involves ensuring maximum benefit is gained from resources you use - recycling is a good example as it enables the same raw material to be used numerous times, and so is using energy efficient equipment and minimising waste in production.

WHAT IS SUPPLY CHAIN MANAGEMENT?

Managing a supply chain for sustainable development means working with suppliers, and encouraging them to work with theirs, in such a way as to jointly improve the overall environmental and/or sustainability performance of a product.

Some companies may have formal 'partnerships for improvement', whereas others work on specific projects as they arise. The aim, however, remains the same - to achieve targets for mutual benefit to both buyer and seller.

Environmentally preferable procurement is a rapidly growing area, and means not just choosing the 'greenest' product or process, but working in partnership with suppliers to achieve a balance of functionality, economics and environmental benefit. Focusing on resource efficiency as part of this can enable very effective economic/environmental win/win situations. An example of this is moving towards higher bulk papers, which give the same perceived substance to the reader, but which reduce the actual tonnage of paper used and the weight of each issue - offering savings in both the cost of paper and of postage in addition to the environmental benefits.

WHY IS SUPPLY CHAIN MANAGEMENT IMPORTANT TO MAGAZINE PUBLISHERS?

Much of the effect of magazines is in their production and distribution, which with most companies is outsourced and so lies within their supply chain. In the context of this handbook, the term means all suppliers involved in paper, print, fulfilment and distribution. Working together with suppliers can be a very effective way for a publisher to improve overall environmental performance.

WHAT DOES PRODUCER RESPONSIBILITY MEAN?

In the EU, producer responsibility falls under its Integrated Product Policy, which states that "All products cause environmental degradation in some way, from their use or disposal". One of the objectives of the 6th Environmental Action Programme is "Where effective, making producers responsible for their products when they become wastes."² This responsibility may be direct or indirect, perhaps through financial contributions from taxation or financing voluntary take-back schemes. Another approach is that of active help towards awareness raising and publicity for recycling.

References and sources of further information related to this section can be found in Appendix B.

² EUROPA (European Commission Environment web pages)

FORESTS AND FOREST CERTIFICATION

FORESTS AND THEIR ROLE



Trees are a renewable resource, and a sustainably managed forest not only provides a steadily regrowing source of solid timber and fibre for pulp but also other environmental and economic services, such as carbon sequestration (absorbing carbon dioxide and storing the carbon), giving a home to a variety of living creatures, benefits to the water cycle, helping with rural development, offering livelihoods and sources of income to millions of people and a place for walking in and enjoying.

WHY ARE FOREST ISSUES RELEVANT FOR MAGAZINE PUBLISHERS?

The profile of forests has been raised over the past few years, to the extent that some consumers take an active interest in sources of timber, and high profile campaigning by green groups is starting to focus on the links between publishing and forest.

As major consumers of paper, magazine publishers have an interest in being aware of issues which may affect the future security of the supply chain. The threat posed by illegal logging is one such issue. It is also helpful to understand the concerns surrounding forest management, and the assurances which may be offered by certification schemes. This will not only enable publishers to make informed purchasing decisions but also to respond to stakeholders' concerns or queries.

In this section:

This section gives a brief summary of the importance of forests in their global environmental context and of their role as a source of fibre for the paper industry. It outlines the progress of forest management schemes, and the way that forest certification is developing to provide a transparent and credible tool to inform purchasing decisions and to provide a means of assurance of timber source. The various schemes are briefly described, as is the need for mutual recognition in a global marketplace. In Appendix A you can find example questions publishers can ask their suppliers about their fibre sources.

WHAT IS THE CONCERN ABOUT FORESTS?

Forests are central to human life and livelihood and provide a home to many indigenous peoples. In recent years, rapid human population growth and migration, industrialisation, and poverty have had dramatic effects on global forest resources. This is not due simply to timber use, but also to land clearance for other purposes. There has also been severe damage by storms and forest fires.

Forest cover is important to regulate the climate, helping combat global warming. It protects against soil erosion, protects watersheds, and therefore freshwater supplies, and protects fish in the rivers.

Although forest area is increasing in some parts of the world, such as the United States and Western Europe³, we are still losing forest overall - the net annual loss between 1990 and 2000 was estimated at 9.4 million hectares⁴. (This figure is derived from the total forest loss figure of 14.6 million hectares minus the 5.2 million hectare annual increase.) Deforestation in tropical regions, loss of 'old growth' (see later in this section for a description of this term) and the overall decline in forests prompt concerns about global warming, reduced biodiversity and scarcity of freshwater.

Paper is not generally related to the problem of declining forest, nor even is the need for timber for any purpose. Deforestation is primarily due to land clearance for agriculture, mainly in poorer areas of the world. Although no firm statistics are available, the United Nations Food and Agriculture Organisation states that

³ PAGE Forest Ecosystems

⁴ SOFO 2001

'Over the years, researchers have identified agricultural expansion as a common factor in almost all studies on deforestation. Indeed, much of the increase in food production has been at the expense of hundreds of millions of hectares of forest. Although there are no solid estimates of how much farm and grazing land was originally under forest, the point remains that a large portion was cleared for agriculture, and that additional land will be cleared in the future.'⁵

WHAT IS BIODIVERSITY? WHAT IS AN ECOSYSTEM?

Biodiversity is the term used to refer to the variety of animal and plant life. It covers all the different species, the variations within each species and also the variety of ecosystems. An ecosystem is a dynamic system in which plants, animals and other organisms co-exist. Together with the non-living components of the environment, these function as an interdependent unit.

This interdependency is important. Destroy one element and the chain may be broken, with unpredictable results. The variety acts as the gene pool for evolution and change, both naturally and through selective cross-breeding to introduce improved food crops and medicines. We are continually making new discoveries of beneficial variants such as disease resistant food plants and drugs from plants hitherto not known to have any medicinal value.

WHAT IS THE RELATIONSHIP BETWEEN FORESTS AND BIODIVERSITY?

Forests contain more than half the earth's animal and plant species. This is an issue in relation to loss of so-called 'old growth' forests, where logging can cause the destruction of unique ecosystems and thus reduce biodiversity. The richest diversity is to be found in the tropical rainforests, which are also suffering the fastest rates of deforestation as land is cleared, mainly for agriculture and other uses.

WHAT IS AN 'OLD GROWTH' OR ORIGINAL FOREST?

This is a term often used to mean forests relatively untouched by human activity and so considered to be in need of protection. The forest may contain multiple layers of tree canopies and various ages and species of vegetation. 'Old' is defined differently for different species and latitudes, and by different organisations, which has given rise to a great deal of confusion. The largest areas of forest where, to some parts of which, the term 'old growth' is applied are the boreal (northern) forests in Canada, Alaska and Russia and the tropical forests of Brazil, Peru, Venezuela and Colombia.

It is not, strictly speaking, the age of the forest which is important; it is that various attributes are more likely to be found in an older, natural forest. These attributes include, for example, rare species which rely on the particular habitat provided by that forest, or areas of religious or cultural significance. Because of the confusion over the name and definitions, other terms have been developed by various organisations to describe those forests in need of particular protection - 'high conservation value forest', for example, and 'forests of exceptional conservation value'. These terms are explained later in the chapter, in the sections on the relevant forest certification schemes.

WHERE ARE SUCH FORESTS BEING LOGGED?

It is difficult to be precise because of the lack of any firm definition of old growth. There are also areas with differing degrees of sensitivity, 'high value conservation forests' for example. Areas referred to as 'old growth' forests are being logged in a wide range of places around the world, both in the western world and in developing countries, and arouse a strong degree of controversy. Such areas include the boreal forests of North America and Russia and some of the tropical forests mentioned previously.

⁵ SOFO 2003

Environmental groups are concerned about potential losses or damage caused by such logging. Forest owners may feel equally strongly that they are behaving responsibly, and that the areas they are logging are of minor concern environmentally because of the extent of areas which are protected (and which are therefore not harvested).

An estimated 12% of the world's forests are in protected areas.⁶ Whether or not this is sufficient to achieve the aim of protecting biodiversity is another area of debate. Two of the reasons behind this are that the designation of these areas as protected is not necessarily related to their value as areas of biological diversity – it may be because of recreational, cultural or historic value; and that management of the surrounding area affects the protected area. The arguments over logging in particular areas are rarely straightforward. Those who own forest land have an interest in the forest and its management and future.

One of the major threats to 'old growth' or ecologically valuable forest areas is illegal logging.

WHAT IS ILLEGAL LOGGING?

This can mean a variety of activities, from logging in protected areas where it is banned, to exceeding permitted harvesting levels, harvesting without a licence or using methods which are not allowed. Illegal logging has been defined as 'the harvesting, transporting, processing, buying or selling of timber in violation of national laws'⁷. The formal definition used in the EU Action Plan for forest law enforcement is that 'Illegal logging takes place when timber is harvested in violation of national laws.'⁸ Governments, industry bodies and paper manufacturers worldwide are co-operating in order to address the problem of illegal logging by various means, including verified audit trails and chain-of-custody certification.

WHAT ARE WETLANDS?

Wetlands are generally areas where water is at or near the surface for some time and plants are adapted to flooding. They include freshwater marshes and meadows, as well as swamps. The main forest type associated with wetlands is mangrove, which is found along sheltered coastlines in the tropics and subtropics. These are important areas of biodiversity, offering spawning grounds and nutrients for a variety of fish and shellfish, as well as providing wood and other forest products. Deforestation of these has been a cause for concern, and driven by conversion to other uses - primarily infrastructure (particularly for tourism), aquaculture, rice growing and salt production. Loss of mangrove is not linked to papermaking. Legislation has been introduced in many areas to protect them and the rate of loss has started to decline.

WHAT ARE RAINFORESTS?

These forests have constantly wet growing conditions. They are found in both temperate and tropical regions.

Temperate rainforests exist in mid-latitudes where precipitation exceeds 150 cm (60 inches) per year and falls during at least 10 months. These forests are slow growing and contain some of the world's oldest and largest trees, including the giant redwoods on the Pacific coast of North America. They are one of the highest sequesters of carbon.

Tropical rainforests are found in the equatorial and tropic zones where rainfall is over 180 cm (72 inches) annually. Typical areas are the Amazon lowland, central lowlands of Africa and from Sumatra and Indonesia to the islands of the western Pacific. These are the richest of all terrestrial ecosystems and the second biggest terrestrial carbon store.⁹

⁶ SOFO 2001

⁷ WWF 'Forests for Life'

⁸ EU Action Plan for Forest Law Enforcement, Governance and Trade (FLEGT)

⁹ PAGE Forest Ecosystems

ARE TROPICAL RAINFORESTS BEING DESTROYED TO MAKE PAPER?

Less than 10% of paper and paperboard products come from tropical forests of any kind.¹⁰ Pine, spruce, eucalyptus and some hardwoods are the main sources. The major cause of tropical deforestation is population pressure, not papermaking, and occurs because of the demand for increased agricultural land, and for firewood.

HOW IS PAPER RELATED TO GLOBAL WARMING?

The paper sector has a relationship to global warming in two ways:

On the one hand, manufacturing, transporting and reprocessing paper, like most other manufactured products, contribute to global warming, as does decomposition in landfills.

On the other hand, the growing forests which provide fibre for paper sequester carbon dioxide - that is take it from the atmosphere and store it in their vegetation and soil. There are still many discussions taking place over what role forests should play with regard to climate change management and emissions targets, but there is general agreement that sustainably managed forests are a valuable carbon sink (means of removing and storing atmospheric carbon) and have an important part to play. There are concerns that climate change itself may cause changes to forests and their growth patterns.

A portion of the carbon removed by trees remains stored in forest products such as wood and paper throughout their life. Current data indicate that paper can retain up to 7% of original carbon.¹¹

IS PAPER THE PRIMARY USE OF HARVESTED FORESTS?

No - the primary use of harvested forests globally is for wood fuel, which accounts for just over half of the total world production of roundwood. Only 14% was used for paper in 2001 - the same percentage as in 1995.¹²

WHAT ARE THE SOURCES OF FIBRE FOR PAPER?

Virgin wood fibre is the primary source of fibre for magazine paper. Production of industrial roundwood (that is wood used for industrial purposes such as sawnwood, wood-based panels, pulp, paper and paperboard, rather than for fuel) comes mainly from developed countries, whose combined production is 79% of total global production.¹³ The leading industrial roundwood producers are USA, Canada, China, Brazil, the Russian Federation, Sweden and Finland¹⁴.

WHAT ARE PLANTATIONS?

Plantations are another forest type which tends to defy precise definition. Degrees of management of a forest range from untouched virgin forest through the managed semi-natural forests which make up approximately 80% - 90% of the forest areas of Europe and the United States to fast-wood plantations, the most intensively managed type of forest, without clear distinctions.

¹⁰ SOFO 2001

¹¹ Wood and Paper Products Store Greenhouse Gases

¹² FAOSTAT

¹³ SOFO 2001

¹⁴ WWF 'The Forest Industry in the 21st Century'

Areas of plantation, using the term to mean 'forests established by planting and/or seeding in the process of afforestation or reforestation'¹⁵, are growing rapidly, particularly in Asia. UN Food and Agriculture Organisation figures for 2000 showed that approximately 5% of world forest was plantation, 62% of which was in Asia. Annual new planting is 4.5 million hectares globally, with Asia and South America accounting for 91%. Older plantations – more than 50 years of age – are almost entirely in temperate and boreal regions.

Plantations offer a very productive source of timber, thus potentially taking pressure off more sensitive areas. Over 20% of the world's total industrial wood harvest comes from plantations. Plantations can also offer many environmental benefits when planned and managed responsibly. The growing trees act as a carbon sink (hence the inclusion of plantation forests within the Kyoto Protocol Clean Development Mechanism projects), they offer an eco-system for wildlife and they can also benefit soil structure and water cycles.

Controversy arises where natural forest is replaced by plantation, with resultant losses to biodiversity, or where management practices are considered to be unsuitable. There are also economic concerns relating to monocultures (large areas of one species) and risks from pests and diseases.

Many recently established plantations have been planted on degraded land – often land which had been inappropriately converted from forest to agriculture which it could not sustain – and some are already demonstrating improvements to soil structure and local biodiversity. Plantations which are helping restore barren land can be found across the world including, for example, India, China and the Republic of Congo¹⁶.

¹⁵ United Nations Food and Agriculture Organisation (FAO)

¹⁶ Fast-Wood Forestry - Myths and Realities

WHAT IS A SUSTAINABLY MANAGED FOREST?

There are various definitions of this. One used by the United Nations Food and Agriculture Organisation in their State of the World's Forests 2003 report is:

'Sustainable forest management refers to meeting present needs for forest goods and services, whilst ensuring their continued availability in the long term. The concept combines the production of wood and non-wood forest products with the conservation of soil, water and biological diversity, while the socio-economic, cultural and spiritual values of forests are maintained or enhanced. The conservation of biological diversity thus constitutes an essential and integral element of sustainable forest management, as recognized in all international criteria and indicators processes.'

This means that even though trees may be cut, forestland will remain as forest and ecosystems will be preserved. The specific management practices required to achieve sustainable forestry vary according to region, ecosystem, tree species and other related factors.

Plantations have different requirements than natural forests, and some forestry schemes reflect this in their criteria. Plantations do arouse controversy. However, when managed sustainably, they take pressure off natural forests while still providing valuable environmental benefits in addition to timber. A recent report published by the Center for International Forestry Research, highlights the regenerative effects of introducing plantations on degraded land, in addition to the economic and social improvements they can bring to such a region.¹⁷

Specific concerns about sustainability of the world's forests, including plantations, include the ecological health of the forests, their wildlife diversity, their resilience to stress and climate changes, their productivity for wood and other resources, the environmental services they provide, and their aesthetic value.

WHAT ARE FOREST MANAGEMENT SYSTEMS?

WHAT ARE FOREST CERTIFICATION PROGRAMMES?

Forest management systems are like any other management system - a scheme giving guidance on how to 'manage' the forest. Certification programmes actually set a management standard to be achieved. Various organisations across the world have started such programmes. At the time of writing this handbook, over 145 million hectares of forest are certified under the main four schemes, over 90% of which are in North America and Europe. Within this total, 48.4 million hectares are under the Programme for Endorsement of Forest Certification schemes (PEFC), 39.7 m ha are Forest Stewardship Council (FSC), 39 m ha are Sustainable Forest Initiative (SFI) or American Tree Farm System (ATFS) (which operate under mutual recognition) and 18 m ha are Canadian Standards Association (CSA)¹⁸. As such schemes are relatively new, they are still developing and changing the way they operate as the operators learn from commissioned research and feedback from stakeholders. Several developments are anticipated in the near future. This handbook therefore only gives a brief outline of each scheme, and a website address where up-to-date information can be found.

WHAT IS CHAIN OF CUSTODY?

Chain of custody is a process to track each forest product back to its point of origin to enable it to carry a label assuring the purchaser that it is from a certified forest. It is a means of ensuring that the fibre does come from a sustainably managed source and it also helps in the fight against illegal logging. With solid wood

¹⁷ Fast-Wood Forestry – Myths and Realities

¹⁸ sources: PEFC, FSC, AF & PA and Canadian Sustainable Forestry Certification Coalition

products it is relatively straightforward, and therefore many are available with chain of custody certification. It is very complex, however, for paper.

Although whole trees are used for paper, it is also made from forest thinnings or from the parts of a tree not used for other purposes - the odd bits left over from cutting timbers for construction or furniture. In the most complicated scenarios, the fibre therefore has to be tracked from the forest to the sawmill, which may serve forests under several owners, then, in the form of chips, it has to be tracked to the pulp mill, which may take wood fibre from several sources. From the pulp mill it has to be tracked to the paper mill, which again may take pulp from several sources. It then needs to be tracked through converters to its final destination. This tracking through all elements of the chain takes time to put into place. It also adds an administrative, and cost, burden to those involved.

It is for such reasons that very little paper is available with chain of custody certification as yet despite the large area of certified forest. This situation is changing as the schemes mature, and tracking systems are developed.

WHY DO DIFFERENT COUNTRIES TAKE DIFFERENT APPROACHES TO FOREST MANAGEMENT?

In addition to different social and political structures and traditions of forestry management, variations in forest type from country to country need to be taken into account. Just one example of the great variability is age - the natural life span for most trees found on the east coast of Canada is around 80 years compared with over 400 on the west coast. The roles that the forests play in people's lives and the ownership and infrastructure also vary widely, and are another important consideration. Some countries have large areas of forest under state or company ownership, others have predominantly small private owners. Russia falls at one end of this scale with all its forests under state ownership and Finland at the other with over 440,000 private owners holding 62% of the forest land and 63% of them with holdings smaller than 20 hectares.

WHAT ARE THE DIFFERENCES AMONG FOREST CERTIFICATION PROGRAMMES?

Schemes may be national or global, independent or industry run. They have different levels of involvement by environmental NGO's and stakeholders other than forest companies or owners, different standards and criteria and differing approaches to ensuring that those standards and criteria have been met. Striking a balance between maintaining rigorous standards for checking compliance and keeping bureaucracy and cost to a minimum so as to keep the scheme accessible to small forest owners is one of the challenges which has driven the development of national schemes.

There are four main schemes that a publisher is likely to come across:

THE FOREST STEWARDSHIP COUNCIL (FSC)

The Forest Stewardship Council is an international non-profit, non-governmental organisation founded in 1993 to develop and promote 'environmentally appropriate, socially beneficial and economically viable management of the world's forests'¹⁹. The intent was also to encourage wood product users to demand products created from wood harvested from independently certified well-managed forests. It is an association of a diverse group of environmental, community and forestry groups, manufacturers and retailers, representatives of the forest industry, indigenous groups and many others with an interest in forest management.

The FSC has adopted the term 'high conservation value forest', using the following definition (which is widely accepted by campaigning groups and environmental non-governmental organisations (NGOs)):

¹⁹ FSC

'High Conservation Value Forests are those that possess one or more of the following attributes:

- a) forest areas containing globally, regionally or nationally significant concentrations of biodiversity values (e.g. endemism*, endangered species, refugia); and/or large landscape level forests, contained within, or containing the management unit, where viable populations of most if not all naturally occurring species exist in natural patterns of distribution and abundance
- b) forest areas that are in or contain rare, threatened or endangered ecosystems
- c) forest areas that provide basic services of nature in critical situations (e.g. watershed protection, erosion control)
- d) forest areas fundamental to meeting basic needs of local communities (e.g. subsistence, health) and/or critical to local communities' traditional cultural identity (areas of cultural, ecological, economic or religious significance identified in cooperation with such local communities).'

(*endemism refers to plants or animals which are only found in a certain area)

The FSC use a set of international Principles and Criteria of Forest Stewardship which are supported by locally-developed standards for each country in which they operate.

Certification requires third-party audits, which have to be carried out by FSC-accredited certification bodies. The audits are of both the actual forest, against the FSC endorsed national standard, and the organisation's management system. There are strict performance standards that have to be met in order to achieve certification. FSC has a chain-of-custody process which extends through to paper, and an increasing amount of this certified paper is now available.

It is the only certification scheme currently supported by the major international environmental NGOs.

Further information about FSC is available from its central website: www.fsc.org, where links can also be found to the different country's sites.

PROGRAMME FOR THE ENDORSEMENT OF FOREST CERTIFICATION SCHEMES (PEFC)

PEFC was launched in 1999 as the Pan European Forest Certification scheme. It is an umbrella organisation, which now extends beyond Europe to include national schemes across the world, and acts as a framework for the mutual recognition of national or regional schemes. In the autumn of 2003, PEFC changed its name to reflect this.

PEFC does not develop national schemes itself, but endorses existing schemes that it considers appropriate, based on its core criteria and guidelines (the Pan-European Criteria for Sustainable Forest Management, formed as a resolution at the third Ministerial Conference on the Protection of Forests in Europe). Standards are therefore not consistent from country to country. It is the largest forest certification umbrella organisation, having widespread support from the forest sector and trade associations.

PEFC requires third-party auditing and has a system in place for chain of custody certification of wood and wood-based products. This includes paper, and the first certified paper was expected to become available at the time of writing.

Both of the bodies operating the North American schemes described in the following paragraphs are members of the PEFC Council. Further information about PEFC can be found on their website at www.pefc.org

THE SUSTAINABLE FORESTRY INITIATIVE (SFI)

The Sustainable Forestry Initiative was set up in 1994 by the American Forest & Paper Association, and is a set of 'principles, objectives, performance measures and indicators which integrate the perpetual growing and harvesting of trees with the protection of wildlife, plants, soil, water and air quality'²⁰. In 2001, the Sustainable Forestry Board (SFB) was chartered as a separate not-for-profit entity with full authority for management of the scheme and associated verification procedures.

The SFI was originally based on principles of self-assessment, but now offers the options of self-assessment, second-party verification (by, for example, a customer) or certification by an independent third-party. Currently there are 136.7 million acres under the scheme, with 96.4 million acres third-party certified²¹.

The SFI has established a system of principles, objectives, performance measures and core indicators of sustainable forestry practices that landowners must meet in order to qualify for SFI certification. The SFI also requires program participants to promote continual improvement of forestry practices.

The SFI definition of 'forests of exceptional conservation value' is based on collaborative efforts between SFI program participants, NatureServe, government, and land conservation organizations using SFI core indicators to identify areas with especially rare forest landscapes. The definition is designed to reflect local differences in biogeographic conditions and trends, societal preferences, economic realities, and ecological definitions. For example, one of the core indicators contained in the SFI standard requires program participants to locate and protect known sites associated with viable occurrences of critically imperiled and imperiled species and communities. The resulting protection plans may be developed independently or collaboratively, and may include program participant management, cooperation with other stakeholders, or use of easements, conservation land sales, exchanges or other conservation strategies.

There is an SFI labelling programme, which allows publishers who purchase from companies within the SFI scheme to display an 'SFI participating publisher' logo, subject to various guidelines which include third-party verification of their wood supply sources.

General information about the scheme is available from the American Forest & Paper Association SFI web pages at www.afandpa.org, along with its annual report and full details of its 2002 - 2004 SFI Standard and Verification Procedures.

THE CANADIAN STANDARDS ASSOCIATION (CSA) STANDARD FOR SUSTAINABLE FOREST MANAGEMENT (CAN/CSA Z809-02)

This standard was first approved in 1996, and is another national standard. The CSA SFM standard is independent of the forest industry, being run by the Canadian Standards Association, and is ISO 14001-based - a combination of an environmental management system and a forestry standard. It requires assessment of on-the-ground management of specific forest areas against a range of issues such as protected areas, biological diversity and aboriginal rights and includes a structure for community participation, but does not set blanket baseline minimum benchmarks. As with systems such as ISO 14001, a forest owner will set their own targets based on criteria such as their location, size, forest type and which aim for continual improvement. Third-party auditing by a CSA registered auditor is a requirement for certification.

CSA has a chain of custody tracking system, which includes pulp and paper.

²⁰ American Forest & Paper Association

²¹ SFI 8th Annual Progress Report 2003

Further information about the Standard is available from:
www.csa-international.org/certification/forestry and from the Canadian Sustainable Forestry Certification Coalition at www.sfms.com/csa.htm

A number of organisations have carried out comparisons of the various certification schemes. These include a matrix produced by CEPI in November 2001 which reviewed a wide range of schemes against a series of indicators, and reports from research bodies and environmental NGOs looking at selected schemes in greater depth. A selection of these can be found in the sources of further information at the back of this handbook.

WHAT IS MUTUAL RECOGNITION? WHY IS IT IMPORTANT?

Paper is an international commodity, traded all around the world. Buyers may suffer unnecessary confusion when they are faced with a range of different labels, particularly when they are labels specific to the country of origin and not familiar in the country of purchase.

Mutual recognition is a term applied to a framework whereby schemes 'recognise' the validity of certification awarded by different certification bodies, and the various bodies involved in forest certification are having many discussions about how to achieve this with forest certification. This would ultimately greatly simplify the decision-making process for purchasers and enable exporters to achieve certification that will be recognised as valid whatever the destination.

WHAT ARE THE DIFFERENCES BETWEEN ISO 14001 AND EMAS AND FOREST CERTIFICATION SCHEMES?

ISO 14001 (the International Standard for environmental management systems) and EMAS (the Eco Management and Audit Scheme) are both schemes that certify the environmental management system rather than a level of performance. Their value to forestry is as a management tool to help achieve a standard - for example the work required to achieve ISO 14001 or EMAS has considerable overlap to that required for many of the forest certification schemes - and to achieve continual improvement, which is a fundamental part of both management schemes. They are not specific to forestry, but have been designed to suit any industry. Both are described in more detail in Section 10 'Certification and Labelling'.

WHAT IS A THIRD-PARTY AUDIT?

This is when an audit is carried out by someone completely independent of the organisation or site being audited - so neither the owner nor manager nor a customer. A certification audit that is 'third-party' can therefore be considered to be an objective, independent audit. A forest certification auditor will audit against the requirements of the particular scheme being followed to check that they are being achieved.

WHO DOES THESE AUDITS?

Forestry schemes offering third-party certification have strict criteria about who can carry out audits. They state that auditors should be accredited, either by the organisation running the scheme or by a body recognised by the organisation. They require that they are people trained in auditing, forestry and the requirements of the scheme they are auditing, and working for an auditing or certification body with appropriate credentials. There are recognised ISO standards for environmental and quality system auditing and auditors.

Appendix A gives suggestions for ways we can help. References and sources of further information related to this section can be found in Appendix B.

WHY ARE PULP AND PAPERMAKING RELEVANT TO PUBLISHERS?

The forests that supply the majority of paper for magazine publishers are only one part of the picture in managing resources to conserve continuing sustainability of supply. Moves by the paper industry towards greater efficiency in use of energy, water and chemicals will also play an important role in both economic and environmental aspects of paper.

Additionally, environmental legislation has an increasing role in some countries. Paper mills which are investing in continually improving the environmental performance for their operation, and are planning ahead, are likely to be best placed as tighter control levels are introduced.

Understanding the context in which paper suppliers are operating will thus help publishers to appreciate not only the environmental significance of their paper selection, but also the longer term prospects of their suppliers.

In this section:

This section gives a general outline of the environmental issues surrounding pulp and paper making, the action that the industry has been taking in reducing impacts and the legislative background. It describes the control mechanisms that paper mills can use, and looks at the question of bleaching methods and the differences between elemental chlorine free (ECF) and totally chlorine free (TCF) processes. Appendix A offers some suggestions for actions that publishers can take and questions they can ask when reviewing their paper supply.

WHAT ARE THE MAIN ENVIRONMENTAL CONCERNS IN PULP AND PAPER MAKING?

The main issues in pulp and paper making, as with many heavy industries, are consumption of raw materials, in this case mainly fibre (non-fibrous materials accounting for only 15% of raw materials in Europe²², for example) energy and water consumption and creation of wastes in the form of solid waste, effluents (water-borne wastes & pollutants) and emissions (air-borne wastes and pollutants).

Pulp and paper is a substantial and capital intensive industry, accounting for 1% of manufacturing turnover in Europe²³ and 7% of total US manufacturing output, and employing 255,000 and 1.5 million people respectively. Major investment has been carried out across the industry, so that in the period 1980 - 2000, releases to the environment from pulp and paper making reduced by 80 - 90%²⁴. Thus progress to date has been considerable. While improvements are still possible, any involving process change are necessarily slow as they need to fit in with investment cycles.

The pulp and paper industry is controlled by two levels of environmental legislation in both North America and Europe. At federal or national level there are the Pulp and Paper Cluster Rule in USA and the Pulp and Paper Effluent Regulations in Canada. In Europe there is the Integrated Pollution Prevention and Control Directive, with its associated national regulations coming into effect across the EU. There is additional legislation at state, country, province or regional level.

Releases to the environment are tracked in the US by the EPA Toxic Releases Inventory, in Canada by the National Pollutant Release Inventory and in Europe the European Pollutant Emissions Register has started doing the same.

²² CEPI Annual Statistics, 2001

²³ CEPI Annual Report, 2002

²⁴ EU IPPC BREF 2000

Environmental management systems are an important aid to ensuring compliance with the legislation, offering a systematic means to measure, manage and improve performance, and take-up of voluntary certified systems such as ISO 14001 and EMAS is increasing. Over 60% of the pulp and paper produced in Europe and Canada comes from mills certified under one of the internationally recognised eco-management schemes²⁵ In the US, a number of mills are participating in the US Environmental Protection Agency's National Environmental Performance Track programme.²⁶

WHAT DO MILLS DO ABOUT EMISSIONS, EFFLUENTS AND ENERGY AND WATER CONSUMPTION?

There are two approaches which can be taken - pollution prevention through changing processes to either reduce or eliminate potential pollutants, and what are known as 'end-of-pipe' solutions which involve treating air or water released in order to remove the undesirable elements.

The prevention approach is preferable from an environmental point of view, and also may offer cost reductions and business benefits over time. However, it is often the case that to introduce a new level of technology requires a substantially changed production line only possible through a complete rebuild. Such major changes therefore have to be part of the mill's long-term investment cycle. End-of-pipe solutions can more easily be 'added on' to an existing production line, but, unlike process changes, are more likely to add to running costs than to be cost-neutral or cost-beneficial.

The type and quantities of emissions and effluents a mill needs to manage vary according to the process being used (which depends on the type of pulp or paper being made), as do energy requirements.

Air emissions and energy

The main air emissions are those created by combustion in energy generation, and are linked to various effects such as climate change, acid rain and respiratory disorders. Energy efficiency and fuel type offer the best scope for pollution prevention methods. Depending on the process they are operating, some mills can burn wood waste and bark, or black liquor from the kraft (or sulphate) cooking process, to generate energy. These are considered carbon neutral, which means that they do not contribute to climate change. Over 50% of energy used in the pulp and paper manufacturing industry comes from this source. Certain mills will have to purchase supplementary fuel or energy, or even all of it, because of the type of pulp or paper they are making.

The introduction of combined heat and power (CHP) plants (also known as co-generation) has been another major improvement. Because of the balanced need for both heat and power in papermaking, this technology offers very high efficiency levels.

Other air pollution control methods available to mills involve treating the air emissions to remove various substances prior to release into the atmosphere.

Effluents and water consumption

The releases to water are a complex mixture of organic substances, many of which are measured by the effect that they have on the water rather than by what they actually are. The actual substances vary from mill to mill subject to what they are making. Options available for preventing and controlling these include changing bleaching process, recycling water used as much as the process allows, and treating process water in effluent treatment plants before it goes back to the environment.

²⁵ ICFPA, 2002

²⁶ International Paper

The extent to which water can be recycled within the process depends on the bleaching method used and the quality required for the end product, but offers additional benefits in reduced water consumption. Consumption of water across the industry decreased by one-third in the ten years to 2002²⁷.

Mills control final water quality through effluent treatment plants that treat waste water prior to release back to the environment. Many mills also monitor the quality of the receiving watercourses on a regular basis.

WHAT DOES BLEACHING DO?

'Bleaching' actually refers to two different processes. One of these is de-lignification. Lignin is the 'glue' that holds the fibre together in its natural form (as a tree), and which has the effect of turning paper yellow over time. 'Chemical pulps', such as the kraft pulps often used in magazine papers, undergo a chemical process to remove the lignin from the wood. The other bleaching process is whitening or brightening the pulp to achieve the desired shade for paper production.

WHAT IS THE CONCERN ABOUT CHLORINE BLEACHING FOR PAPER USED IN MAGAZINES? IS IT STILL A CONCERN? WHY HAS CHLORINE BEEN USED TO BLEACH PULP?

Traditional pulping technology used chlorine and chlorine-based compounds in the bleaching process. Chlorine is particularly effective at removing the lignin and brightening the pulp without weakening it. However, in the 1980s environmental groups discovered dioxins, formed in the process, in fish downstream from mills. Since then, new processes have been introduced to phase out use of elemental chlorine and to reduce use of chlorine-based bleaches.

Adsorbable organic halogens (AOX) is the parameter used for measuring chlorinated compounds in mill effluent. Overall levels have dropped considerably since the issue was raised, and are regulated by legislation to levels deemed safe by the national or federal bodies responsible.

WHAT IS DIOXIN? WHY IS IT A HEALTH CONCERN?

Dioxin is not specific to the paper industry, but refers to a large family of chemical compounds in a larger grouping known as chlorinated-organics. Dioxins come from many sources, some of which are naturally occurring, and some are what is known as 'persistent toxic substances', a term which refers to the way they accumulate in fatty tissue rather than being processed and released. Other toxic sources include smoke from burning wood, particularly forest and brush fires, and from incinerators using old technology (not state-of-the-art waste-to-energy facilities).

The compound usually referred to when people use the term dioxin in relation to the pulp and paper industries is a by-product of chlorine-based bleaching processes, and has been substantially reduced (as mentioned above).

HOW HAS THIS BEEN REDUCED?

The paper industry has substantially reduced emissions using two approaches. One is treating the effluent prior to release and the other is to change the bleaching systems.

In Europe, bleaching using chlorine gas has been totally substituted by other processes, reducing AOX by over 90%²⁸ and some mills are operating totally chlorine free. In the US, Elemental chlorine free (ECF) bleaching now accounts for 96% of bleached chemical pulp production²⁹. Canada also no longer uses

²⁷ ICFPA, 2002

²⁸ CEPI, 2002

²⁹ AF&PA, 2002

elemental chlorine in its bleaching, and mills have reduced their organochlorine discharges by 80 - 90% from 1980s levels³⁰.

WHAT ARE THESE ALTERNATIVE BLEACHING PROCESSES?

Although there are many other bleaching chemicals – hydrogen peroxide, oxygen, ozone, to name a few - these are not freely interchangeable. Each one has its own efficiency, its own way of working, differing whitening ability, and potential environmental impact. In addition, a number of the other chemicals are more expensive than chlorine and some may degrade the pulp strength.

Changing bleaching method does not simply involve substituting chemicals. It may be necessary to introduce new plant and change the process steps used, requiring substantial investment and long-term planning. There is a great deal of research still being carried out into bleaching techniques.

There may also be unknown environmental effects from other chemical processes, which makes it risky to move away from those which are understood without further research. This is one reason why closed loop systems, in which no potentially harmful substances are released into the aquatic environment, are appealing. They have possible economic benefits as well as the environmental advantages. However, this has not yet been achieved on a commercial scale.

WHAT ARE TCF, ECF AND TEF?

TCF stands for Totally Chlorine-Free. In TCF papers, no chlorine or chlorine derivatives have been used in bleaching the paper pulp. Only 7% of pulp is produced using this process, mainly in Northern and Central Europe.³¹

ECF stands for Elemental Chlorine Free. In 'traditional' ECF paper, a chlorine derivative such as chlorine dioxide has been substituted for elemental chlorine gas, substantially reducing the formation of chlorinated organic compounds.

Further improvements can be achieved with what is known as 'enhanced ECF' processes. These involve an extended 'cooking' phase, oxygen de-lignification or ozone bleaching, and further reduce AOX levels. Other process changes can also allow reduction of bleach plant effluent when enhanced ECF bleaching is used, such as filtrate recirculation. Changing over to these processes involves substantial, expensive changes to plant, and in the United States it may therefore not yet be possible to source sufficient paper made using these technologies.

TEF means Totally Effluent Free, a process which is 'closed loop' and releases no water-borne effluent into the environment. Papermakers have not yet managed to achieve this commercially for graphic papers because of restrictions in technology. Some good examples of minimising discharges to effluent water do exist, using evaporation plant technology to produce pure water and recyclable concentrate. Research into closing the loop is still ongoing.

IS THERE A DIFFERENCE IN THE ENVIRONMENTAL EFFECTS OF TCF AND ECF?

This subject has given rise to a great deal of debate and research. The latest studies looking at toxicity levels in the effluent stream (whether the water discharged from the mill could be harmful to fish or plants) show no detectable difference in this respect between effluent from modern enhanced-ECF bleaching plants and TCF bleaching plants.³² However, environmental groups still advocate moving away from any processes using

³⁰ FPAC, 2002

³¹ Hamm & Götsching (2002)

³² EU IPPC BREF 2000, VDP-INFOR Project (No. 19) 2002

chlorine or its derivatives, partly because of other concerns related to the manufacture of chlorine itself (chlorine is used for many other purposes in other industries).

Arguments for using ECF bleaching relate to increased fibre strength and lower energy, chemical and fibre use compared to TCF bleaching. When you also take into account the potential for increased fibre life-span in recycling resulting from this, it offers good benefits in resource efficiency.

So, taking a holistic view, the results are still inconclusive - but definite progress is being made in the direction of reducing impacts of the bleaching process.

WHAT IS A 'MINIMUM IMPACT' MILL?

A minimum impact mill is a future concept, giving direction to development research by paper manufacturers. It looks at a broad range of challenges, including maximising resource efficiency and minimising emissions and cross-media effects, taking into account economic aspects and the working environment.³³

WHAT CAN MILLS DO ABOUT SOLID WASTE?

Managing solid waste can be a challenge, particularly for de-inking plants, where the removed ink, coating, fillers etc. and contaminants such as plastics add to the volumes of waste. As much waste as possible is usually recycled within the process or used as fuel by mills with their own electricity generation, as this offers economic benefits. Other wastes are recycled externally where possible - metal from wire stitches and paper clips for example. Many organisations are researching uses for de-inking, pulping and papermaking by-products, and some of the current uses include manufacture of building blocks, soil conditioners and cat litter.

WHAT ARE HIGHER BULK PAPERS?

These are papers which are less compressed than more standard magazine papers, giving them a greater thickness in relation to their weight. Using such papers can offer resource savings, but may not be suitable for all applications.

Appendix A gives suggestions for ways we can help. References and sources of further information related to this section can be found in Appendix B.

³³ EU IPPC BREF 2000

THE RECYCLING LOOP

WHY IS RECYCLING RELEVANT TO PUBLISHERS?

The continuing drive towards better resource efficiency is one of the factors keeping issues of paper recycling firmly in the spotlight, certainly in some countries. As a highly visible consumer of paper, magazine publishing is a regular focus of questions relating to this area. The role that magazines play in the paper loop is important and understanding it will help publishers achieve and demonstrate good practice.

In this section:

This section looks at the background drivers for using recycled content papers, the arguments and counter-arguments, particularly those related specifically to magazine papers. It also briefly covers design for recycling. Appendix A additionally offers some suggestions of how publishers can help support the role of their magazines in the recycling loop as a valuable source of recovered fibre.

WHAT IS THE RELATIONSHIP BETWEEN MAGAZINES AND RECYCLING?

Magazines play a vital part in the recycling loop. They are an essential source of recovered fibre for recycled paper manufacturing. They also are seen by environmental groups as an avenue for increasing use of recycled fibre and thus publishers are coming under increasing pressure to do so. The argument is not straightforward, as there are strong reasons for the high virgin fibre content of many grades of magazine paper and there will always be a need to introduce virgin paper into the cycle.

Arguments presented in some countries for increasing recycled content are that many of the 'downcycling' opportunities - using fibre to produce lower grades of material that need less processing - are fully exploited, with high levels of recycled content in these products. Printing and writing grades (the category that magazine papers fall into) make up a large proportion of all paper produced, but use a comparatively low percentage of recycled content fibre.

In Europe, for example, printing and writing grades (excluding newsprint) account for around 37% of production, but have a recovered paper utilisation rate of only 8.6% compared to 69.3% in newsprint, 90.9% in case materials and 64.6% in household and sanitary tissue³⁴. In the US, although the figures are different because of the strong export market for recovered paper, the pattern is similar, with printing and writing grades having the lowest utilisation. The low utilisation in this grade is perceived by many, including environmental campaigning groups and some public bodies, to be mainly for historical reasons 'which no longer apply' with the improved technologies available today, and increasing the use of recovered fibre within this grade is therefore regarded as a strong opportunity for increasing recovered fibre use overall and reducing consumption of virgin fibre.

Counter arguments are that printing and writing is a very broad category, and other papers lend themselves to high recycled content far better than the types of paper generally categorised as 'magazine papers'. Magazine papers are usually lighter weight than most other papers in this grade and have demanding performance requirements, as they are printed four colour process at high speeds, frequently with heavy ink coverage. There is therefore a necessity for high fibre quality in the manufacture. As virgin fibre input to the recycling loop is always needed, because fibres cannot be recycled indefinitely, there are therefore good arguments for magazines to use virgin fibre, and then to focus on getting this fibre into the recycling loop by encouraging greater recycling of magazines.

³⁴ CEPI, 2002

Other arguments relate to economics, which can prove a barrier to increasing use of recycled paper in the magazine paper market place. A concern is that where all relevant recyclable paper is recovered and/or there is no available reprocessing capacity, prices may increase if demand is stimulated. However, in many countries, collections are increasing and surplus processing capacity is available.

Furthermore, the nature of the raw material required (segregated, high quality recovered paper), the comparatively low yields achieved and the quality demands of the end product all make de-inked pulp which is suitable for magazine papers more expensive (and resource intensive) to produce than pulp for 'lower grade' applications.

WHY RECYCLE?

There are many reasons for recycling. One is efficient use of resources - the wood fibre can be used several times, and doing so makes maximum use of forest yield (the volume of paper product produced and used per hectare of forest). Using recycled fibre where possible to supplement virgin fibre used offers further resource efficiencies as well. Since the fibre has already undergone the initial processing stage, subsequent re-processing is a less intensive operation in terms of resource use, including energy and water, and wastewater load³⁵, particularly for lower grade end products. Re-using the fibres, and so increasing their life-span, spreads the overall impact of the processing over a longer usage period, and the environmental cost 'per use' of the fibre is therefore lower.

Reducing the volumes of solid waste for disposal is another reason - recycling takes the paper out of the waste stream and avoids the problems in some countries of diminishing landfill space and opposition to the building of new incineration plants. Even where there is landfill space available, it is still environmentally preferable to divert paper from it in order to avoid the releases to air and water created as it decomposes.

WHY IS THE TERM 'RECOVERED PAPER' REPLACING THE TERM 'WASTE PAPER'?

The term waste implies that the paper is valueless, which it is not. It is a valuable resource, which the paper industry is trying to have classified as a raw material rather than a waste in order to have this value recognised.

WHAT DO THE 'RECOVERY RATE' AND 'UTILISATION RATE' TELL YOU?

The recovery rate is the percentage of all paper used which is then taken back for recycling. It is measured by the ratio between paper and board products which are recovered and total consumption. The utilisation rate is the percentage of recovered paper used compared to overall paper production, either in total or by sector. In other words, it is a guide to how much recovered fibre, on average, is used to make that type of paper.

HOW ARE THESE RATES CHANGING?

Recovery and utilisation rates are increasing steadily, as a result of improved infrastructure and technology, allowing more grades to be successfully recycled, and increased rates of paper being separated out for recycling rather than disposed of in the standard waste stream. Increased separation is, in many cases, driven by such factors as pressure on landfill and legislation.

Globally, the consumption of recovered fibres amounted to nearly 46% of all fibres used for production (across all paper and board grades) in 2000³⁶. Regional recycling rates for 2001 were roughly 41% for

³⁵ RAL, Basic Criteria For The Award Of The Environmental Label, March 2001

³⁶ ICFPA, 2002 (Data from J. Pöyry Consulting)

Canada³⁷, 48% for America³⁸ and 52.1% for Europe³⁹.

The American Forest and Paper Association and the Confederation of European Paper Industries have both issued declarations setting targets for increased paper recovery. AF&PA announced in March 2003 a '55% recovered paper goal by the year 2012' for America, and CEPI set a '56% recycling rate for the year 2005' for Europe (set in November 2000, when the rate was 48.7%).

ARE THERE LIMITS TO HOW MUCH CAN BE RECOVERED?

Yes, there are. About 15 - 20% of paper and board products are either non-collectable or non-recyclable⁴⁰. These include wallpaper, cigarette papers, hygienic papers and so forth. There are also documents and books which are archived permanently.

USE AND PROCESSING OF RECOVERED FIBRE

CAN RECOVERED PAPER ELIMINATE THE NEED TO USE TREES FOR VIRGIN FIBRE IN PAPER?

No. Virgin fibre will always be needed in paper-making - it cannot be a completely closed loop. Although you can always recycle a piece of paper, fibres have a finite lifespan and become worn out to the point where they are 'lost' in the processing. In order to keep the loop going, therefore, virgin fibre has to be added to replace this. Using recovered fibre extends the lifespan of the fibre, enabling us to maximise use from the resource and so meet our needs more efficiently. Using this fibre in the content of products which will themselves be recycled enables multiple re-use of fibres and thus maximises their lifespan. If recovered paper is exclusively used in items which are, by their nature, unrecoverable after use, such as tissue, the opportunities for multiple use are lost.

WHAT ARE THE LIMITS TO USING RECYCLED FIBRE IN PRINTING AND WRITING GRADES OF PAPER?

The apparent limits are rising continually. There are now 100% recycled grades of a quality which would not have been considered possible a few years ago, including magazine grades and materials suitable for brochures and corporate communications. These papers are not currently made in the quantities that virgin papers are. Performance barriers affect recycled content for magazine papers and the current limits vary considerably according to grade and weight. For the lower weight magazine papers only up to 10 or 20% is currently achievable.

WHAT KINDS OF PAPER ARE USED IN RECYCLED CONTENT COATED PAPERS FOR MAGAZINES?

The main grades used for making such magazine papers are sorted graphic papers from various sources, including sorted household collections, recycling banks and unsold returns. Mechanical fibre, such as that from virgin newsprint, yellows in the light because of the lignin content, which limits how it can be used.

³⁷ Canadian Paper Recycling Association

³⁸ AF&PA

³⁹ ERPC 2001

⁴⁰ CEPI Environment Report, 2002

HOW DOES RECYCLING FIT INTO THE OVERALL PICTURE OF ENERGY AND CHEMICAL USE?

Because the fibre has already been processed once, de-inking paper to recycle it is generally less chemically and energy intensive than processing virgin paper, although the energy used is more likely to come from fossil fuels. Higher quality recycled products, requiring cleaner, whiter pulps, demand more processing than lower grade materials.

The de-inking process used in modern mills is the 'flotation method' which, put very simply, consists of slushing the recovered paper with water, using cleaners and screens to remove contaminants, adding a form of soap and pushing air bubbles through the fibre/water mixture to float off the ink, which can then be skimmed off the surface. After this, the mixture will often be further screened and washed to remove fillers, small fibres and so forth. If the pulp needs additional brightening, this can be done without chlorine-based bleaches. The degree of processing required will vary according to the end product, which is one of the arguments for 'downcycling' into lower grade products (which require less processing).

UV varnishes and digitally printed products can cause specks in de-inked pulp which are very difficult to remove, so paper recyclers reject material of which it is a significant proportion (which is not the case for magazines). Paper printed with water-based inks cannot be de-inked (the coloured fibres have to be dispersed within the pulp instead). The paper industry, printing companies, ink suppliers and suppliers of de-inking technology are working together to develop the recyclability of these paper products.

Looking at energy consumption, energy is necessary at each stage of the process. Recycled paper production uses less total energy than making virgin paper, again because of the processing already carried out, and so decreases the energy requirement 'per life'. The Paper Task Force (an American group comprising Duke University, Environmental Defense, Johnson & Johnson, McDonald's Corporation, The Prudential Insurance Company of America and Time Inc.) carried out a series of life cycle analyses (an analysis in which all the environmental effects that a product has in its manufacture, use and disposal including, in this case energy use from harvesting of trees or waste paper collection, are quantified). This showed clear environmental benefits in recycling a variety of paper types rather than using virgin fibre and disposing of it⁴¹ including reduced overall energy consumption, and reduced greenhouse gases. The European Union's Reference Document on 'Best Available Techniques in the Pulp and Paper Industry' has also found that 'RCF (recycled fibre) pulping requires comparatively less total energy for processing than is needed for chemical and especially for mechanical pulping'.⁴² De-inking does require use of purchased energy or fuel, with the resultant greenhouse gases if it is fossil fuel-based. Incineration or disposal to landfill also result in greenhouse gas emissions. Again, it is a point to be considered that the greater the degree of processing needed, such as washing and filtering, the greater the energy requirement.

WHAT PRODUCTS ARE MADE FROM RECYCLED MAGAZINE FIBRE?

A whole range of products are made from recycled magazines. They include newsprint, further magazine papers, tissue, office papers and board products.

IS RECYCLED PULP LESS EXPENSIVE TO PRODUCE THAN VIRGIN PULP?

The costs fluctuate considerably, as they depend on numerous variables, which mean that the answer to this is 'it depends'. The cost of raw materials is an important factor, and costs of virgin pulp are continually changing, as are costs for suitable quality recovered paper. Cost of collection of waste paper makes a considerable difference to its price, and one which is affected by the introduction of better recycling schemes with segregated systems and will vary from country to country, as well as over time.

Other considerations include yield, which depends on both the proportion of actual usable fibre in the recovered paper (as the paper will contain coatings and fillers in addition to fibre), and the amount of

⁴¹ Paper Task Force update, February 2002

⁴² EU BREF July 2000

processing required. This is determined by what the end product is to be. More processing incurs higher costs. The disposal of wastes from the process is an increasing cost, especially to de-inking plants, although the fibre residues are re-used in several ways.

Economies of scale and new technologies also influence the cost per tonne of pulp. Increased recycling, improved logistics for collection and sorting and increased production volumes of recycled content paper all reduce the cost of recycled paper production in some areas.

USING RECYCLED CONTENT PAPERS

ARE THERE ANY TECHNICAL PROBLEMS IN PRINTING MAGAZINES ON RECYCLED CONTENT PAPER?

There are variations in the quality of recycled-content papers, as with virgin papers, and some will therefore perform better than others. Factors which affect this include the source of the recycled pulp, because of differences in technology at different mills, the basis weight of the paper and the proportion of recycled fibre (as a general rule the lighter the paper weight, the lower the percentage of recycled fibre that can be used without affecting performance). Some magazine printers have found that medium weight papers with up to 20% recycled content can be used with no detrimental effects on runnability or print quality. Heavier weights can perform well with as much as 100% recycled content.

WHAT IS MEANT BY POST-CONSUMER AND PRE-CONSUMER?

Post-consumer material has fulfilled its intended purpose and then been discarded. Pre-consumer material has not yet reached the intended final consumer, and includes material such as trimmings from envelope converters and printers' waste. News-stand returns have been defined as pre-consumer waste - this does not, however, reduce the value of recycling them.

The reason for giving post-consumer material preferential emphasis, in Europe in particular, by environmental organisations is because it requires a great deal of effort to persuade consumers to segregate material for recycling and others to collect and deliver it. This is therefore the area which needs most attention in terms of encouraging increased recycling. News-stand returns, by comparison, are already returned for recycling by a sophisticated and effective reverse distribution system in many countries.

Some publishers argue that this distinction between pre- and post-consumer magazines does not accurately reflect that both go through the same de-inking process and achieve the same resource recovery objective.

WHAT AFFECTS RECOVERED PAPER DEMAND AND SUPPLY IN THE LONG TERM?

This is a complex issue. Demand is shaped by basic economics: A decline in demand for recovered paper drives down prices for it.

Various factors shape the supply response:

- The behaviour of private paper collectors is affected by price. With low profit margins and high costs of carrying inventory, private collectors reduce their collection and supply when recovered paper prices drop.
- By contrast, municipal collection may be less responsive to price drops because the system is driven by waste diversion objectives. As a result, surpluses appear and prices drop further. This is not reversed until prices have fallen enough to affect demand.

This scenario is further complicated by legislation. Some countries have legislative targets for waste diversion, and some have legislative targets for recycled content in paper used by the public sector.

Actual demand for recovered fibre is determined by consumer demand for the finished product, in which the technical capability to achieve papers which are fit for purpose is also an important factor, and by market confidence in the duration of the consumer demand. Volatility is a major barrier to recycling as market stability is important to the economics of recycling.

IS CAPACITY FOR PROCESSING RECOVERED PAPER AN ISSUE?

There is more than sufficient processing capacity available globally to meet the targets which the paper industry bodies have set themselves, and in some countries de-inking plants have even been closed or temporarily taken off-line. The question is more whether sufficient recovered paper will be collected to supply the industry's future needs, and of the industry being in a position to match the type of paper recovered to suitable end uses (and thus to appropriate processing plants).

WHAT ABOUT OTHER RECYCLED PRODUCTS?

Many publishers use large quantities of polythene in mailing copies. There is increasing availability of polywrap with a recycled content which can be used. Paper products, of course, are produced from a natural renewable resource, whereas many plastics are petroleum-based, and therefore use a non-renewable resource.

Publishers can also use recycled content paper in direct mail and promotional activities.

WHAT GOOD USE CAN BE MADE OF PAPER, OTHER THAN RECYCLED PAPER PRODUCTS?

A range of products are currently used or are being trialled using recovered paper. They included moulded pulp packaging (for fruit, eggs, light bulbs and so forth), insulation material made from old newspapers (treated with fire retardant), animal bedding, briquettes or compressed logs for use as fuel, composting and mulching, construction materials such as panels and boards, and marine absorbent products.

WHAT DOES 'CLOSING THE LOOP' MEAN IN RECYCLING?

The 'recycling loop' describes the entire process of recycling, from initial use of a product, through collection and reprocessing and back again to use. Buying recycled is therefore referred to as 'closing the loop', as products cannot be described as having been recycled until they have been incorporated into new products, thus coming full circle.

ENABLING MAGAZINE RECYCLING

CAN MAGAZINES BE RECYCLED?

Magazines most certainly can be recycled, and are a valuable source of good quality fibre. There is, however, a common consumer perception that they cannot be recycled. It is therefore beneficial to the recycling loop to inform readers that they can recycle their magazines and to encourage them to do so. However, before using a recyclable symbol or phrase, it is important to check the regulations regarding its use in your country or state. In the USA, for example, it may only be used without a qualifier if recycling programmes are available in a 'substantial majority of communities for that product'.

HOW IS RECYCLING AFFECTED BY PRESSURE SENSITIVE ADHESIVES USED IN MAGAZINES FOR INSERTS, LABELS, ETC.?

Some adhesives create problems when recycling paper, particularly those which disperse in process water and contaminate the pulp. Adhesives which either remain intact and can be screened out or which are water-based are preferred.

The paper industry and the glue and adhesives industry are working together to develop recycling-friendly adhesives. Testing criteria are under development by various organisations for identifying such adhesives but were not available at time of publication: see the web sites shown under Sources of further information for this section in Appendix B.

IS RECYCLING AFFECTED BY COVER-MOUNTS?

Yes - as these have to be removed manually and treated separately prior to recycling the magazine, which can add to the cost and can therefore have an adverse effect on the economics of recycling.

Appendix A gives suggestions for ways we can help. References and sources of further information related to this section can be found in Appendix B.

WHY ARE PRE-PRESS AND PRINTING RELEVANT TO PUBLISHERS?

Awareness of environmental issues related to printing is likely to be increasingly valuable to publishers.

Careful monitoring and management of the printing process brings dual benefits, in both increased resource efficiency and reduced environmental impacts in production and in improved recyclability at end of life.

In this section

This section summarises the environmental impacts of printing and what steps the print industry has and is taking to manage these. It looks at the role technology has played in reducing impacts whilst bringing benefits in terms of quality and cost-effectiveness. Appendix A gives suggestions for publishers who wish to work with their printers to address the effects of production, and questions to ask.

PRE-PRESS

WHAT IS THE RELATIONSHIP OF PRE-PRESS AND DIGITAL TECHNOLOGIES WITH ENVIRONMENTAL ISSUES?

Pre-press has changed dramatically over the past few years, and its environmental impacts have also reduced. The main concerns in traditional film-based pre-press were related to use of resources, use of chemicals and waste. Large volumes of film were generated from the multiple interim stages required which then became waste, along with considerable volumes of process water and chemical. This waste was reduced substantially with digital page make-up, and still further with the introduction of one-piece film output.

Digital photography and computer-to-plate technology now have the potential to completely eliminate the need for film and film processing. New technologies in plate processing also reduce chemical consumption and process waste, as do technologies allowing direct engraving of gravure cylinders from digital data instead of etching.

PRINTING

Environmental regulation affecting printers is increasing, particularly in Europe where new legislation which will directly affect printers is being developed and implemented to enact European Union (EU) Directives. Printers have been steadily improving their environmental performance for some time, but publishers are likely to be seeing new systems introduced to reflect recent concerns. They may also be offered new opportunities to work with printers to reduce the overall environmental effect of their magazine as we learn more about topics such as how to print for best recyclability.

WHAT ARE THE MAIN ENVIRONMENTAL CONCERNS IN PRINTING?

The printing industry is another large industry, but unlike pulp and paper making it is extremely diversified, being made up of many small firms - about 85% of printing companies world-wide employ fewer than 20 staff. Many of the concerns raised about the environmental impacts of printing are related to the smaller printing companies which may not be fully effectively regulated. Magazine printers are usually larger establishments with modern technology and large-scale plant and equipment.

Issues in printing are related to use of resources and chemicals, with the main concerns being emissions to the atmosphere and generation of waste. The industry is covered by a substantial amount of legislation, and larger companies will, in many countries, require permits for operation, which control releases to the environment. Specific aspects covered by legislation in both the USA and Europe include hazardous waste (this covers waste which needs special treatment prior to disposal, and ranges from press-room chemicals to, in Europe, fluorescent light bulbs); chemical releases, with additional legislation controlling volatile organic compound (VOC) emissions; protection of water, controlling both releases into the sewer system and inadvertent release to, for example, streams and rivers, which can occur via storm drains or surface water drains in forecourts; and a great deal of health and safety based legislation which regulates handling of chemicals. There are differing approaches to energy, which include imposition of taxes in some countries, and industry agreements. Certain releases to the environment by printers have been tracked in the USA for some time through the Environmental Protection Agency's Toxic Release Inventory.

There are six main printing processes - offset lithography (usually referred to as 'offset' or 'litho'), gravure, letterpress, flexography, screen printing and digital (which breaks down further into different subsets). Chemical use differs according to the printing process carried out. The majority of magazines are printed litho (offset) or gravure. In the USA 64% are printed litho (offset), and 36% use the gravure process; in Europe gravure takes a slightly greater percentage, with Germany the highest at 59% of magazines gravure and only 41% litho (offset), and the rest of Europe slightly more in favour of litho (offset)⁴³. Gravure and litho use different types of inks and chemicals.

WHAT ARE THE CONCERNS ABOUT SOLVENTS USED IN LITHO (OFFSET) PRINTING?

The concerns about printing solvents mainly relate to emissions, specifically of volatile organic compounds (VOCs). These are defined as any organic compounds that react, in the presence of sunlight, with nitrogen oxides to form ozone. Whereas high level ozone (the ozone layer) is something we want to protect and retain, low level ozone combines with fine particulates to form photochemical smog. It is a lung irritant, and contributor to climate change. Many printing solvents fall into this category, and also evaporate readily at low temperatures - for example, the isopropyl alcohol used in dampening solutions and wash-up chemicals in litho printing. In heatset web offset, there are also emissions from the inks as they are dried.

CAN LITHO PRINTERS DO ANYTHING TO REDUCE THE IMPACT OF SOLVENT USE?

There are many ways that printers can reduce these impacts, and emissions from printing plants have reduced considerably over the past twenty years. Heatset web offset printers can use afterburners, condensing units or biological treatment units to treat waste gases from the drying ovens.

In both heatset web offset and sheetfed lithography, fount (or fountain) solutions containing isopropyl alcohol (IPA) are commonly used. Its purpose is to break the natural meniscus, or surface tension, on water to enable even wetting of the plates. There are various approaches being taken to address this issue.

There is a system called 'waterless litho' that uses no fount solution at all, but has silicon coated plates and differently formulated inks. However to change over to this system means substantial investment in new production equipment, as standard printing presses cannot be used. The special printing plates and inks are not yet widely available, as it is a new market. There are currently only 600 waterless printers world-wide, of which 200 are in the USA⁴⁴. (To put this into context, there are about 54,000 litho printers in the USA⁴⁵.) This system also offers additional advantages in reduced make-ready waste and water consumption, and reduced need for solvents in the blanket wash, so take-up is likely to grow as the technology becomes established and consumables more widely available. It is however a system currently best suited to shorter run work.

⁴³ European Rotogravure Association

⁴⁴ The Waterless Printing Association

⁴⁵ EPA

Many consumables manufacturers are working to develop alternatives to IPA for use with fountain solutions - either different, more benign chemicals or even electronic methods to achieve the desired result.

Other ways in which printers can reduce impacts from the fountain solution include using more accurate dosing methods, so as to use the absolute minimum amount necessary, chilling the fountain solution to reduce evaporation and keeping the system as closed as practicable. These options are usually already built in to modern printing presses of the type used by magazine printers.

The third main area of solvent use is press cleaning chemicals. Automated wash up systems have helped greatly in reducing the impact of these, as they reduce exposure to the air and so cut down evaporation. Manufacturers are again working on developing alternatives with lower solvent content or less volatile solvents, and also on vegetable-based cleaning agents (VCAs).

General good housekeeping by a printer can also help to reduce the amount of solvent going into the air - for example keeping lids on containers.

WHAT ARE THE CONCERNS WITH INKS IN LITHO PRINTING?

Concerns with ink centre on two main areas, which are the mineral oil content and ink wastage. Much of the ink wastage at a printing plant will arise from use of special colours, through ordering with a safety margin to avoid the risk of running out part way through a print run. As magazines are usually printed in four process colours, this is not so much an issue. The other main cause of wastage is ink remnants in containers. Such wastage can be reduced by use of bulk silo pumping systems or use of ink-cartridges - whichever is appropriate. These systems are common practice for large-scale magazine printers.

Increasing numbers of manufacturers are producing inks with vegetable oil, which are a renewable resource and therefore considered environmentally preferable.

WHAT ARE THE CONCERNS WITH SOLVENTS IN GRAVURE PRINTING?

The main solvent used in publication gravure printing is toluene, which is a VOC. It is a carrier for the inks, is released as a vapour during the printing process (with a small amount remaining in the printed product), and is also used for press cleaning. Important considerations when using toluene are to contain and minimise emissions in order to control releases into both the atmosphere and the working environment.

CAN PRINTERS DO ANYTHING TO REDUCE THE IMPACT OF TOLUENE?

Toluene is readily adsorbed by activated carbon and released by heating the carbon with steam. This means that printers can install condensers that draw in emissions from the presses and condense out the toluene for re-use. All publication gravure printworks in Europe and North America have solvent recovery systems. About 97% of the toluene used is captured and recycled⁴⁶. Other 'good housekeeping' methods for reducing emissions through solvent evaporation also apply, as with litho printing, and methods for preventing or capturing such 'fugitive' emissions of toluene within the factory are available.

Work is being carried out to investigate the possibility of a change from toluene-based inks to water-based inks; however at present it is not generally possible to print using this process to a quality suitable for magazine production. There is also a downside to use of water-based inks in that, for recycling purposes, they cannot be removed by flotation de-inking, which is the main process currently used. In some cases, even pulp washing fails to remove the very small, hydrophilic particles of such inks. Alternative chemical carriers have also been investigated, but these raise other problems of their own.

⁴⁶ Gravure Association of America

WHAT ARE THE CONCERNS WITH WASTE IN PRINTING?

A great deal of the waste produced in printing can be recycled, and has been for many years - for example waste paper and printing plates. The waste chemicals, including some of the inks, are more difficult, as many are designated as 'hazardous waste' in different areas. This means that they need special treatment in order to dispose of them safely.

CAN PRINTERS DO ANYTHING TO REDUCE THESE IMPACTS?

The printing industry has already substantially reduced waste through the introduction of new technologies. Computerised press controls, colour management systems, pre-flight checking software have all helped reduce waste levels in addition to improving quality and speed of turnaround, as have automated press washing systems.

There are several other options available to help reduce the amount of waste produced. Ink delivery systems to reduce ink waste have already been mentioned. Solvent recycling systems are available which allow wash-up chemicals to be cleaned and reused, not only reducing waste but also reducing overall solvent consumption. Careful paper buying, particularly with regard to reel widths, cuts paper waste.

At a 2003 UK industry seminar entitled Strategies for Success, the 'Captains of Industry' who were speaking were asked to give their tips for a successful printing business. One of the tips was 'measure everything you can influence'. This tip also applies to environmental management - and especially to taking waste out of the process and thus achieving an environmental/economic win/win situation.

The UK Government have been running a programme aimed at helping printers improve their environmental performance, and have estimated that by using low- and no-cost methods for waste minimisation they could save up to 1% of turnover⁴⁷, and could also save as much as 10% - 20%⁴⁸ off their energy costs.

WHAT DO ISO 14001 AND EMAS MEAN TO PRINTING?

Detailed information about these two systems is given in Section 10. For a printer to achieve ISO 14001, the company has to satisfy the certifier that they:

- understand the ways in which their operation impacts on the environment
- know what environmental legislation is relevant to them,
- have made a commitment to reduce pollution and comply with legislation
- have put a system in place which enables them to manage the way in which they impact the environment and thus achieve the above
- have plans to cover emergency preparedness
- are achieving 'continuous improvement'

EMAS, the European Eco Management and Audit Scheme, requires the same basic management system, but also demands that they publish a verified environmental report which tells the reader exactly what impact they do have, and quantifies their impacts and progress.

The initial implementation of such a scheme can involve changes to general management, and thus be initially disruptive to day-to-day work, and also entails the expense of certification and surveillance fees and either consultancy fees or adding an environmental specialist to the staff. Many printers,

⁴⁷ Envirowise

⁴⁸ Action Energy

because of this cost, may therefore choose to follow environmental management systems based on ISO 14001 but with staged implementation, and may even not take the final step of ISO 14001 certification. In recognition of financial constraints, particularly for smaller companies, there have been several national 'step-by-step' systems introduced, such as BS 8555 (UK) and Green Dragon (Wales). The UK has a print-specific scheme developed as a joint initiative between the Periodical Publishers Association (PPA) and the British Printing Industries Federation (BPIF), which is provided by the BPIF. In the long term operating an environmental management system enables tight monitoring to achieve greater efficiencies in resource and energy use, with the accompanying cost savings.

Appendix A gives suggestions for ways we can help. References and sources of further information related to this section can be found in Appendix B.



DISTRIBUTION AND RECOVERY

WHY ARE PACKAGING, DISTRIBUTION AND RECOVERY RELEVANT TO PUBLISHERS?

Optimising the balance between sales and unsolds, minimising transport miles and managing subscriber lists are all important to the economics of publishing. They also play an important part in managing environmental impacts.

Recovery rates of paper for recycling are considerably higher than for general waste, but the magazine industry can still play a role in increasing consumer awareness further to improve recycling rates.

In this section:

This section looks at the ways in which magazines are distributed, and the developments in sales-based replenishment. It reviews the reverse logistics used to enable consolidated batches of unsold magazines to be delivered to recyclers, issues raised by packaging and what happens to magazines when readers don't recycle. Appendix A includes suggestions for publishers who wish to be active in further enabling recycling.

HOW ARE MAGAZINES DISTRIBUTED?

There are two core distribution systems for magazines, running in parallel with each other, to fulfil the dual purchase systems - retail news-stand sale and subscription.

Subscription magazines are prepared for the postal service by either the printer or a mailing house. If a mailing house handles the operation, the magazines are generally delivered there in bulk. The mailing house or printer will wrap them (enveloping or polywrapping them for posting) and address them. The data for addressing is mailsorted by computer, which means that the addresses are printed out in sets relating to their postcode or zip code. Magazines can then be bundled in sacks pre-labelled for the postal service to collect and be taken directly to their regional sorting office.

Magazines for retail news-stand sale are distributed via a sophisticated network, linking printer, distributor, wholesaler and retailer, which has been developed to enable a large and disparate number of sales outlets to receive an appropriately timed and regular delivery of a wide range of publications for sale.

Bulk deliveries from the printer to distributor and on to the regional or local wholesale distribution depots will usually be by large trucks. Thereafter the various publisher products will be split down and order picked into the quantities required for each retail outlet, and consolidated into batches with other publications or goods in order to minimise physical deliveries to each outlet.

In countries where there is a high percentage of news-stand sales, such as the UK, with approaching 90%, and much of Europe, and where outlets are generally densely spread, magazine deliveries will be delivered by small trucks, or vans, on a daily basis jointly with newspapers. Where the percentage of newstand sales is low, or delivery points are more widely spread, such as in the USA with around 15% news-stand sales, magazine deliveries tend to be less frequent and on a separate schedule from newspapers and are bulked up and delivered on a basis of two or three times per week, with larger vehicles covering a larger area. In each case, the method selected is based upon careful logistical analysis.

WHAT ARE THE CONCERNS RELATED TO MAGAZINE DISTRIBUTION?

Use of transport for distribution gives rise to vehicle emissions and also uses resources - fuel, oil, water and tyres. Old tyres are a particular concern in waste streams, as they are unsuitable for landfilling or incineration,

other than in specialist units. There are several research programmes looking at uses for old tyres, and so far they have been used successfully as one of the ingredients to make low-noise surfacing materials for roads, as raw material for carpet underlay, and for making bollards. Vehicle emissions are a significant source of pollution and greenhouse gas.

Distribution economics, supported by use of technology, has encouraged and enabled distribution networks to achieve an environmental and economic win/win situation. Consolidation of magazines with other magazines, and with newspapers where practicable, minimises mileage and consequent impacts. Reduced mileage not only offers environmental improvement, but also lowers costs, aligning economic and environmental benefits. Increasingly, the application of computerised vehicle scheduling programmes further enables the most effective route planning, keeping mileage to a minimum.

WHAT ARE THE CONCERNS WITH POLYBAGS?

Standard polybags are manufactured from non-renewable resources, and are an inert material. They have good calorific value if incinerated, and can be recycled, but, as the majority are disposed of by the consumer, effectively spreading the volumes of waste thinly over many homes, in many countries the usual disposal route is to landfill. In landfill, as they are inert, they remain a waste problem. Concerns are therefore mainly related to resource depletion and a desire to keep overall volumes of waste created for disposal to a minimum. Magazine wraps form only a small proportion of all plastic packaging in the municipal waste stream (other plastic packaging includes, for example, packaging for food, toiletries and toys and games), and plastics as a category forms between 3% and 15% across the USA and Europe.

ARE THERE ALTERNATIVES TO CONVENTIONAL POLYBAGS?

Alternatives to conventional polybags are starting to come onto the market but are not yet mainstream items, and there are still issues which can cause difficulties in a conventional magazine wrapping line or in the postal system. Such issues include process problems relating to the flexibility of the material, the way it reacts to heat, printability, and also colour and/or transparency of the material.

Options worth exploring, and watching for future developments, include recycled polybags and biodegradable plastics made from renewable resources such as cornstarch. Should biodegradable and non-biodegradable plastics require separation, this may present practical challenges to consumers and wholesale operations.

WHAT ARE THE CONCERNS WITH LABELS?

Mixing materials creates recycling difficulties - paper labels which are attached to polythene wrapping act as a 'contaminant' in the recycling process. Inkjet addressing directly on to the wrap is an alternative that avoids this, as is keeping labels unattached inside the wrap.

WHAT ARE THE PROS AND CONS OF SALE OR RETURN?

New launches, the short shelf life of magazines, the unique nature of the content of each issue, a highly competitive market and the buying patterns of consumers and advertisers all mean that some oversupply and buffer stock are necessary to ensure the widest possible availability and exposure.

The sale or return system means that retailers carry full stocks, offering the best availability to the consumer. This inevitably means greater wastage than if retailers did not have the option of return, but removing that option would mean consequentially lower availability as retailers would limit their stock levels to what they could be confident of selling. Reduced availability has to be weighed against overproduction to achieve the best balance between service to the consumer and advertisers and environmental considerations. There are

huge numbers of outlets (for example, over 50,000 in the UK) selling magazines and newspapers. However well the publisher anticipates demand, even only one surplus copy per outlet is significant overall.

Publishers and wholesalers operate sophisticated forecasting systems to best place supply, reflecting detailed analysis of outlet and market trends, combined with supply and returns data by location, title and issue, across the range of outlet types and geographical locations.

A major environmental advantage of the sale or return system is that the distribution network is used to collect all subsequent excess stock for recycling. This is generally achieved at the same time as delivery, thereby incurring minimal additional miles and emissions. This collection system offers the best opportunity to divert unsold waste from municipal waste streams, which is the risk if magazines were sold on firm sale and unsold copies were therefore the responsibility of the individual retailers, where a thin spread of waste would exist in many places every day.

WHAT ARE THE POSSIBILITIES FOR MINIMISING THIS EFFECT?

Technology is opening up opportunities for use of sales based replenishment systems, whereby an initial stock only is supplied to the retailer to be topped up as required. This offers the potential to reduce buffer stock requirements and may possibly be a way to achieve reduced production without sacrificing availability. For such a system to be effective, retailers need to supply timely and accurate electronic point of sale data quantifying, on a daily basis, sales by title by retail outlet. There is still much work to be carried out by and with retailers for this information to be readily available to the necessary degree of accuracy.

Sales based replenishment also has the effect of altering the supply logistics, as it may create a requirement for stockholding and additional handling and order picking by wholesalers. This would mean additional costs which would need balancing against savings made from the system. Should additional deliveries be required then the extra miles and emissions would again need to be balanced against possible savings in paper and print usage from reduced production.

The dynamics of such systems are under review. Careful calculations are needed to balance waste with vehicle movements, and to work out possible coverage. Only a modest number of the largest sell-through titles are likely to match with an effective replenishment model. Additionally, as small outlets do not generally use electronic point of sale systems, sales based replenishment is currently only an option for a small number of large retailers.

WHAT HAPPENS TO UNSOLD MAGAZINES?

As mentioned previously, a great strength of the sale or return system is the logistics for handling unsold magazines. As they deliver the day's stocks, the vans pick up unsolds to take back to the local or regional depot on their return journey.

Unsolds are consolidated at the wholesale depots where wraps and covermounts are removed, allowing magazines to be delivered in cleansed, bulk loads to the recycling plants, ready for processing. Magazines are a valuable part of the mix for recycled newsprint and other paper. As a recovery programme, this achieves a desirable end result with least environmental impact.

WHAT HAPPENS TO THE TRANSIT PACKAGING?

Magazines need to be securely packed in transit for both protection of the magazine and safety in handling. The types of packaging used are pallets, plastic strapping and either plastic wrapping material or cardboard or plastic boxes. Some of this packaging is re-used for returning unsold copies. Other elements may be recycled, particularly at larger operations such as wholesalers or supermarkets which have facilities for segregated collection. If it is not re-used or recycled by the recipients, it will enter the municipal waste stream.

WHAT HAPPENS TO MAGAZINES WHEN READERS HAVE FINISHED WITH THEM?

Many readers will recycle. Recycling is considered preferable according to the waste hierarchies for both the US and Europe. Magazines disposed of with the general waste will enter the municipal solid waste (MSW) stream, where their fate varies according to location.

Paper recycling has achieved far higher rates than the recycling rate for general waste. For example, the recycling rate for paper in Europe as a whole is 52.7%⁴⁹, whereas that for MSW (municipal solid waste or 'general' waste) is only around 15%. (This figure is an overall figure reflecting a very wide range, from just 12% recycling in the UK to 52% recycling in Germany. The rate is affected by infrastructure, the maturity of recycling systems and legislation.)

It is still more usual for MSW (general waste) to be landfilled - 67% across Europe (ranging from a low of 7% in Switzerland to the highest percentage, 80%, in the UK). The next most commonly used disposal method is incineration, which accounts for 17% across Europe, again varying considerably from country to country⁵⁰.

The picture is similar for the US – the paper recovery rate is 48%, compared to a figure of 30% for recycling of MSW, with the greater percentage again going to landfill (55%)⁵¹.

Stimulating reader awareness and willingness to keep magazines separated for recycling is thus important to further improve collection levels.

HOW ARE MAGAZINES COLLECTED FOR RECYCLING?

Unsold, as described earlier in this section, are collected using the reverse logistics built into the distribution system. Magazines outside this scheme are collected by two main methods - 'bring schemes', which are the paper banks to be found at civic amenity or recycling centres, in supermarket car parks or in various other locations, and doorstep (house to house) collection schemes. Some office recycling schemes also include magazines.

WHAT HAPPENS TO COVER-MOUNTS ON UNSOLD MAGAZINES?

Covermounts, in those countries where they are used, represent a mixed range of materials, generally unpredictable in mix, volume and spread. The material is available at each wholesale depot, but is essentially thinly spread and often not of sufficient mass to be economically consolidated for specialist outsourcing or reuse. Currently, although not in all countries, such material generally flows to landfill.

WHAT ARE THE ISSUES WITH MAGAZINES IN LANDFILL OR INCINERATION?

The issues are related to the 'waste hierarchy'. The OECD (Organisation for Economic Cooperation and Development) definition of waste minimisation puts recycling before energy recovery, in order of preference. Both the US and European waste strategies also take recycling to be the preferable option.

Arguments for incineration with energy recovery are that paper is a fuel source, and is wood-based and therefore can be argued to be carbon neutral. Waste-to-energy incineration plants 'recover' the energy by generating electricity. Arguments for recycling as the preferred alternative are that the fibre is a valuable resource which can be re-used, and that re-processing waste paper offers the best environmental cost/benefit ratio for the lifespan of the fibre. Recovered fibre from magazines is an important raw material for recycled newsprint manufacturers as well as for some magazine paper grades.

⁴⁹ CEPI Special Recycling Statistics 2002

⁵⁰ Statistics (for 1995) taken from European Environment Agency Topic Report No 2/2002 & UK Strategy Unit report 'Waste not, Want not', 2002

⁵¹ Municipal Solid Waste in The United States: 2002 Facts & Figures, June 2002

Landfill falls at the lowest level of the waste hierarchy - the least preferred disposal method. No value is gained from the waste, except in the very few landfill sites where methane is captured for energy recovery. Generally the methane, which is a greenhouse gas and a by-product of paper (and other biodegradable items) breaking down in landfill, is released into the atmosphere. Leachate is a liquid which also is formed by the breakdown, and can escape and thus risk contamination to groundwater.

Both the US and Europe have programmes in place to reduce landfilling, particularly in respect of biodegradable waste.

Appendix A gives suggestions for ways we can help. References and sources of further information can be found in Appendix B.

WHY ARE LABELLING AND CERTIFICATION RELEVANT TO PUBLISHERS?

Environmental labelling was developed as a tool to help purchasers and specifiers, but with numerous national schemes operating in a global market they are becoming more a source of confusion.

In this section:

This section aims to reduce the confusion by explaining the main labels and certification schemes that a publisher is likely to come across.

WHAT ARE THE OBJECTIVES OF ENVIRONMENTAL LABELLING?

Environmental labelling is intended to be a simple means of giving accurate and helpful environmental information in order to encourage use of products with reduced environmental impact. Purchasers are likely to come across three forms of labelling - formal 'eco-labels', manufacturers' own product claims and environmental product declarations. The international ISO 14020 series of standards gives guidance on all three, which it classifies into Types I, II and III.

Formal eco-labelling schemes (Type I) operate to published criteria, and require third-party audits of the product to ensure conformance. Such labels can be used by purchasers to help with product selection, and may also be accepted as evidence of compliance to environmental requirements, for example as part of a specification.

Manufacturers may also label products with their own product claims (Type II) which are not part of a recognised labelling scheme and are not independently verified. ISO 14021 establishes rules for such self-declared labels, also known as 'green claims'. A 'claim' is information appearing on a product, its packaging, or in related literature or advertising material, which can be taken as saying something about its environmental credentials. It can take the form of text, symbols, or graphics.

Type III labels, environmental product declarations, offer quantified environmental data from pre-set categories of parameters based on a life cycle assessment (LCA) of the product type. They may, optionally, be third-party certified and are again a useful information source.

WHAT IS ENVIRONMENTALLY PREFERABLE PURCHASING AND HOW CAN LABELS HELP?

Environmentally preferable purchasing is a way of involving an organisation's supply chain as part of a strategy to improve environmental performance. It will often involve looking at environmental performance of suppliers, product selection and the ways in which products are used. Products may be evaluated on their 'whole life costs', a method which looks at environmental and economic costs for raw material, product manufacture, use of the products and end of life. Strategies may also involve partnership work with suppliers to work towards lower impact ways of achieving particular requirements.

Environmental labels are at their most effective when used as an information tool to aid product selection as part of a considered policy in which the objectives of the organisation are used as a framework, and labels or product declarations as a means of identifying those products which fulfil the organisation's requirements. For publishers with an environmentally preferable purchasing strategy, working to criteria set as part of their environmental policy or management system, labels can, in some countries, offer a simple means of shortlisting products which fulfil requirements, and independent certification of performance, which may not be available otherwise.

Working with suppliers with certified environmental management systems adds to the overall aims of environmental improvement, but does not always guarantee specific standards. Therefore, for example, if a publisher has a policy of sourcing from sustainably managed forests, they may request paper with chain-of-custody forest certification to assure themselves that this requirement is fulfilled.

WHAT KINDS OF LABELS ARE RELEVANT FOR MAGAZINES AND MAGAZINE PUBLISHERS?

Labelling potentially covers several stages of the magazine life cycle. The categories include recycled content of the paper, certification of the forest management practices used for paper fibre in the magazine, the bleaching process used for the paper, impacts during the pulp and paper production process, printing and printing inks and recyclability of the magazine.

The main forestry labels (CSA, FSC, PEFC and SFI) are covered in Section 5; examples of other labelling schemes that have categories and criteria relevant to magazine publishing are:

- Blue Angel (Germany), Eco-Mark (Japan), Environmental Choice (Canada), Environmental Choice (New Zealand), Environmental Labelling (Korea), EUGROPA recycled mark (EU), European Eco-label (EU), Good Environmental Choice Programme (Australia), Green Seal (USA), NAPM recycled mark (UK), Nordic Swan (Nordic countries).

Publishers are most likely to see labels used for paper. Those which are probably the more familiar are Nordic Swan, Green Seal and Canada Choice, which look at impacts in production, and materials used to varying degrees; Blue Angel which, when applied to paper, looks specifically at recycled content in addition to impacts in production and the NAPM and EUGROPA recycled marks for paper which look solely at recycled content.

The mix of labels can be extremely confusing, especially as many are very narrow in what they cover. Most of these labels are either national or regional, and not understood elsewhere. As paper is an international commodity, this adds to the confusion for purchasers. Mutual recognition, which some of the forest schemes are working towards, does appear to be in the interest of publishers inasmuch as it offers a level of transparency and common labelling.

Other sources of environmental information are environmental product information sheets such as the Paper Profile scheme. This is a voluntary scheme for paper manufacturers whose members have agreed to supply particular environmental information in a common format.

WHAT ARE ISO 14001 AND EMAS?

ISO 14001 and EMAS are voluntary schemes for independently audited environmental management systems, and are not the same as an environmental label. The main differences are that they apply to the company and the process, not the product, and that there is no set performance standard which a company has to achieve - each company sets its own targets.

ISO 14001 is an international standard, controlled by the International Organization for Standardization in Switzerland. It is applicable and understood worldwide, unlike most environmental labels. What this certification shows about a company is that it has made a commitment to improving its environmental performance, has made the necessary resources available to achieve this, and is following a programme to do so. Both ISO 14001 and EMAS require continual improvement.

An environmental management system, or EMS, is a system for identifying, managing and improving an organisation's environmental impacts. It works, like many management systems, on a 'plan → do → check → act'

feedback loop. ISO 14001 is the international standard for environmental management systems. If a company is awarded certification, it means its management system has been audited by an independent third party and conforms to the standard for environmental management systems. It is not a measure of its actual environmental performance.

The basic requirements of the system are that a company must:

- Plan:** Assess the company's environmental position (which includes identifying the effects it has on the environment, and all relevant environmental legislation)
Gain commitment at top level to comply with environmental legislation, reduce pollution and achieve continual improvement
Set an improvement programme with objectives and targets
Draw up an environmental policy statement
- Do:** Identify training needs, and implement required training
Communicate internally and externally
Define roles and responsibilities, and ensure that any necessary resources are available
Document and control the system
Develop accident and emergency procedures to limit environmental consequences
- Check:** Monitor both the system and the company's environmental aspects
Review progress against targets, and conformance to legislation
Take action to correct where necessary
On a regular basis (usually annually) carry out a full management review of the system
- Act:** Make any necessary changes to ensure the system remains effective and achieves continual improvement

The requirement for accident and emergency procedures involves having measures planned 'just in case' and necessary equipment available in order to prevent the environmental damage which could result from unanticipated leaks and spills or atmospheric releases, in addition to having preventative measures to stop them happening in the first place.

A company has to commit to comply with environmental legislation in order to achieve ISO 14001 certification. Systems for maintaining compliance are checked for effectiveness as part of the certification audit, but verification of actual compliance is beyond the scope of a certification audit. It is important to note that legislation does vary considerably across the world.

EMAS, or in full the Eco-Management and Audit Scheme, is a European scheme that has an environmental management system conforming to ISO 14001 as its core. It arose from a European Council Regulation, known as the EMAS Regulation. The scheme is voluntary, and its aim is to recognise and reward those organisations that go beyond minimum legal compliance and continuously improve their environmental performance. It is administered through 'competent bodies' in the various EU member countries.

It has additional requirements to publish an 'environmental statement', which is a report of a company's environmental impacts, its programme of objectives and targets and progress towards them, and for independent verification of reported information. The EMAS statement can provide valuable information for publishers to help with purchasing decisions.

Both schemes require a company to undergo regular surveillance to ensure they maintain conformance, with periodic re-audits.

WHAT IS ECO-FOOTPRINTING?

An ecological footprint is a means of quantifying and comparing effects of individuals, organisations or even countries. It is defined as the area of land required to sustainably provide the required resources and absorb any wastes, and thus can be used to compare the impacts of quite different industries. It can also be used as an indicator for measuring improvements. Its versatility, and its simplicity as a means of communicating to non-specialists, means that it is gaining popularity as an environmental tool.

References and sources of further information can be found in Appendix B.

APPENDIX A: WAYS WE CAN HELP



Below are some suggestions for questions that magazine publishers can ask and actions they can take to help with improving the environmental performance of their magazines. Not all will be relevant or appropriate to all magazines. We hope that what is here will also stimulate discussion and further ideas.

They are arranged to match each section in the handbook for ease of reference.

FORESTRY AND FOREST CERTIFICATION

Questions a publisher can ask in order to learn more about the fibre source of their paper are:

- Do you know the original fibre source of your pulp?
- Does any come from old growth forest or areas important for conservation?
- What is your definition of old growth forest or areas important for conservation?
- Is your fibre purchased from certified forests?
- Under which system(s) is the forest certified?
- Does this system use third-party audits?
- What percentage of the fibre comes from these forests?
- Do you have chain-of-custody certification for the paper?
- Do you have independently verified tracking systems to ensure that fibre you use is from certified forests?
- How do you ensure that the fibre of the paper is not from illegal logging?

PULP PRODUCTION AND PAPER MAKING

The following are suggestions for publishers wishing to address any of the issues from this section more closely as part of their purchasing strategy.

- Talk with manufacturers as much as time allows. Spending time discussing what is required from the paper offers the opportunity to work towards the 'optimum' specification for particular requirements. Whereas a paper made to a specification which is too low for the purpose will not perform well, a paper which is over-specified may have incurred additional environmental costs, in the bleaching for example, as well as additional financial costs.
- For some applications, higher bulk papers may offer an advantage, giving a lower weight for the same perceived substance.
- Take a consistent approach, looking at overall environmental performance of mills and plans for future improvement, rather than addressing a single issue in isolation.

There are also questions a publisher can ask in order to find out more about the way a mill is managing its environmental impacts, such as:

- Does the mill have an environmental report or EMAS statement? Reading this will give information about long term plans for environmental improvement. It will also give information on environmental effects, such as releases to the environment, water and energy consumption, so that you can see what improvements are being made over time.
- Does the mill operate a formal environmental management system, such as ISO 14001 or EMAS? Such systems are based on a principle of continual improvement of the main environmental effects of their particular process.
- Where formal reports are not available (EMAS, for example, is a system currently only available in Europe), ask for information to show how the mill manages its environmental effects, what its plans are for long term improvements, what its past targets are and what progress was made. Achieving targets is not always possible - the important consideration is continual progress towards them.
- Where Paper Profiles are available (mainly in Europe), asking for these will provide useful information about the environmental performance of a particular paper.

THE RECYCLING LOOP

Publishers who wish to become involved in continuing to enable and encourage magazine recycling can play an important part. There is already an effective system of collection and recycling of unsolds, but many consumers still do not recycle magazines they have read. Therefore raising awareness that magazines can be recycled, and the importance of readers doing so, is helpful. Publishers can encourage more consumer recycling of magazines, can support recycling schemes that use old magazines and can support the work of paper manufacturers to increase recycling.

Enabling recycling is more complicated, and linked to research which is being carried out in the manufacturing industries which support magazine publishing. Key areas to be aware of for publishers who wish to work towards improved recyclability are:

- Non-paper elements within magazines (plastics, sachets and samples) which are not easily removed (the staples used for binding do not cause any problems).
- Adhesives which are 'recycling friendly'. Current recommendations are dispersion adhesives which are non-redispersible and water soluble adhesives. Pressure sensitive and hot melt adhesives are also acceptable provided they meet certain requirements. Testing criteria are under development to identify such adhesives and are planned to be available in the near future.
- Water-based varnishes, which are more 'recycling friendly' than uv varnishes (which cause specks in de-inked fibre)
- 'Difficult to remove' inks and dyes - certain reds create problems, as do some drying components in inks
- Water based inks, as these are not de-inkable currently.

Dialogue between the research bodies and the professional bodies representing the various industry sectors is playing a key part in helping to find workable solutions. Individual publishers can contribute by keeping up to date through their own organisations and working closely with suppliers to make best use of findings.

Publishers wishing to use recycled content paper may also find it helpful to ask their suppliers if they offer a suitable recycled content grade for their purpose, and if they do not, to ask the reason.

PRE-PRESS AND PRINTING

Publishers, working closely with their printers, can accomplish much not only to reduce the production impact of their magazines but also to produce them with the aim of making them easier to recycle (see above). Although each individual benefit may seem small, they quickly add up over time and across the industry.

Areas which publishers can look at are:

- Taking waste out of the process
- Maximising use of digital workflows reduces physical materials used (and also transport impacts)
- Tight quality control procedures and integrated colour management systems (between publisher, repro house and printer) reduce wastage caused by errors or quality issues
- Looking at trim sizes and effective use of paper (not only for the magazine, but also for any mailing and promotional materials) minimises paper waste
- Proficient mailing list management reduces wasted mailings or subscription copies
- Processes or materials: in addition to the potential recycling difficulties mentioned in the previous section, certain processes or materials can increase environmental impacts of production, either through the nature of the substances used or through additional energy or transport requirements. These include some of the special inks and coatings available and additional specialist finishing processes. Metallic inks, for example, contain heavy metals (copper and zinc) which offer a disposal problem in de-inking sludge, and certain fluorescent colours involve difficult-to-remove dyes. Your printer may be able to advise on the effects of such choices (and see References and Sources of further information in Appendix B).
- Transport requirements during the various stages of the production process: is there a way that miles travelled can be reduced?

Questions you can ask your printer to learn more about how they are managing their environmental impacts include:

- Does the printer operate an environmental management system (and aim towards continual improvement)?
- What is the printer doing to minimise its air emissions?
- How is the printer working to minimise its solvent consumption?
- What waste management and reduction programmes is the printer running?
- What is the printer doing to reduce the impacts of its energy consumption?
- Does the printer operate a policy of using environmentally preferable products (such as inks, press washing chemicals and so forth) wherever practicable?
- Is the printer monitoring resource/material flows in order to increase resource efficiency (and reduce costs)?
- If your association has developed an environmental assessment system, is your printer using it?

DISTRIBUTION AND RECOVERY

Below are some suggestions for publishers who wish to look further at reducing impacts in distribution and recovery.

- Keep up to date with developments in alternatives to conventional polybags, for substitution as appropriate when suitable materials are available. Where practicable, avoid use of packaging for individual magazines.
- Keep up to date with research into environmentally preferable options for dealing with covermounts. Areas to be aware of are adhesives used, types of covermount, best practice for disposal and best practice for use of them.
- Where practicable, avoid mixing materials used for transit packaging, to enable easier separation for recycling.
- Look at the practicalities of re-usable transit packaging as an alternative to one-trip packaging. (Logistics of return and storage may create their own challenges.)
- Keep up to date with developments in sales-based replenishment systems and sales forecasting systems, so as to be able to make best use of available technology in these areas.

APPENDIX B: REFERENCES AND SOURCES OF FURTHER INFORMATION

B

The references listed here are those referred to by the footnotes, and are arranged in alphabetical order within sections to match those in which they appear, followed by sources of further information for that section.

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Environmental Labelling (Korea): www.kela.or.kr

EUGROPA (Europe): www.eugropa.com

European Eco-label: www.eco-label.com

Global EcoLabelling Network: www.gen.gr.jp

Good Environmental Choice Programme: (Australia): www.aela.org.au

Green Seal (USA): www.greenseal.org

International Organization for Standardization: www.iso.org

National Association of Paper Merchants (NAPM) (UK): www.napm.org.uk

Nordic Swan (Scandinavia): www.svanen.nu

Paper Profile: www.paperprofile.com

APPENDIX C: GLOSSARY

This glossary is provided to give magazine executives a reference to terms used in this Handbook when discussing environmental issues related to magazines. It is not intended as a comprehensive dictionary, but as a general resource to be supplemented by other materials as needed.

Acre

Measure used in the United States and UK for land. One acre = .405 hectares.

AOX (Adsorbable Organic Halogens)

The parameter used for measuring chlorinated compounds in mill effluent. A low AOX figure is preferable.

Basis weight

A term which applies to the weight of a standardised measure of a paper. For example, grammes per square meter (gsm) in Europe, or pounds per ream of a standard size in the USA.

Biodiversity

The term that describes the full variety of plant and animal life in the world or within a natural community or ecosystem.

Bio-fuel

Fuel derived from living (as opposed to fossilised) matter, e.g. bark, wood.

Biomass

Non-fossilised organic matter.

Black liquor

Residual liquor from the kraft cooking process containing spent chemicals and wood residues.

BOD (Biological Oxygen Demand)

A measure used to indicate the amount of biodegradable organic matter in effluent water. It shows the amount of dissolved oxygen consumed by micro-organisms to decompose organic compounds in water in a specified number of days. High BOD values deplete the normal oxygen content of the water environment.

Brightness

Brightness is measured optically by test instruments that indicate reflectance of blue light. Sometimes called whiteness.

Broadleaf Trees

A deciduous type tree having relatively wide, flat leaves; as opposed to the needle-like leaves of conifers. These trees drop their leaves annually.

Carbon Sequestration

A term used to refer to growing forests absorbing carbon dioxide from the atmosphere and storing it in their biomass.

CHP (Combined Heat and Power)

Generation of both heat and electricity from fuel.

Clearcutting

A forest management method that involves felling and removing an entire stand of trees. Clearcutting may be done in blocks, strips or patches.

Coated papers

Paper to which a coating has been applied on one or both sides, using a mix of clay or carbonates and latex to create a high quality printing surface.

COD (Chemical Oxygen Demand)

Measure of the concentration of slowly degradable organic substances in effluent water. The amount of oxygen required for the complete decomposition of organic compounds in water, determined by chemical methods. High COD values deplete the normal oxygen content of the water environment.

Commercial Forest

Forest land that is able to grow commercial timber within an acceptable time frame for an economic return.

Conifers

Cone-bearing types of trees with needle-like leaves. These trees do not drop their leaves annually.

Contaminants

Non-wood fibre materials – additives, chemicals and other materials – which are placed in or on the paper for specific user purposes, but which inhibit recycling of the paper. Adhesives present particular problems.

Deciduous

Trees or shrubs which shed their leaves annually. They are also called broad-leaf trees.

Deforestation

The removal of trees with no intention to replant or regenerate trees; the land is cleared for agricultural, grazing, or development purposes and the land does not return to forest.

De-inked Fibre

Paper fibre which has had ink and other non-fibre material removed in preparation for reuse.

De-inking or Deinking

The processing of removing ink and other undesirable materials from recovered paper. Carried out in order to reuse the fibre in another product.

Dioxin

A specific group of organo-chlorides formed by chlorine and organic materials. One form of dioxin is formed as a by-product of elemental chlorine bleaching processes when the chlorine combines with lignin in the wood.

ECF (Elemental Chlorine Free)

Pulp made without the use of elemental chlorine gas in the bleaching process.

Ecosystem

A dynamic system of plants, animals and other organisms, together with the non-living components of the environment, functioning as an interdependent unit.

Effluent

Liquid waste discharged into a river, lake or other other body of water, or into the sewer system.

EMAS

Eco-Management and Audit Scheme. A voluntary initiative designed to improve companies' environmental performance. It was initially established by European Regulation 1836/93 (now replaced by Council Regulation 761/01). It has ISO 14001 as its core environmental management system, with additional requirements, including that of regularly producing an independently public environmental statement that reports on environmental performance.

Endangered Species

Any species which is in danger of extinction throughout all or a significant portion of its range.

Endemic Species

Species that originate from and exist only within, a particular, limited, geographic area.

Flotation De-inking

A process where air is blown into a dilute fibre suspension. Ink particles adhere to the air bubbles and rise to the surface where they are removed

Fragmentation

A term used to describe a landscape where areas of forest have been removed, leaving the remaining forest as 'islands' of trees in a cutover environment. The major concern with fragmentation is the effect of the loss of connected forest cover on species movement and dispersal.

Free-Sheet

Paper that contains less than 10% groundwood pulp.

Gravure

A printing process where the image is recessed into the surface of the plate or cylinder, which is flooded with ink and the surface scraped clean to leave ink in the image areas only. It is generally used for long runs as the origination costs are relatively high.

Groundwood

Mechanical pulp made by grinding wood against an abrasive surface. Lignin is left in the pulp.

Habitat

The natural home or environment of an organism or species.

Hardwood

The wood from broadleaved trees, most of which lose their leaves in autumn. Such trees typically have short fibres and are used in papermaking to obtain good formation, smoothness and opacity.

Harvesting

Timber felling, pruning and topping in the forest and transport from the forest location.

Hectare

Measure of land used in Canada, Europe and other areas using the metric system. One hectare = 2.47 acres.

Industrial Roundwood

Wood in its natural state (see Roundwood) which is intended for industrial or manufacturing purposes as opposed to fuel.

ISO

The International Organization for Standardization [sic]. A network of national standards institutes from 148 countries working in partnership with international organisations, governments, industry, business and consumer representatives, acting as bridge between public and private sectors. ISO has a Central Secretariat in Geneva, Switzerland, that coordinates the system.

ISO 14001

The International Standard for environmental management systems.

Kraft pulp

Chemical pulp which has been manufactured using sodium sulphate as the main cooking chemical. The predominant method of chemical pulping.

Lignin

A binding agent found between the fibres of a plant. This is the 'glue' that binds cellulose fibres together to give a tree its rigidity.

Lithography (also offset-lithography)

The most widely used printing process today. The image is on the same plane as the surface of the printing plate, and is treated to accept ink and transfer it to the paper or board via an intermediate rubber blanket (to prevent abrasion). The rest of the plate is treated to reject ink.

Mechanical Pulp

Pulp made by the grinding of steamed or boiled wood (without the addition of chemical agents). Also known as groundwood.

Monoculture

Cultivation of a single crop in a given area.

NGO

Non-governmental organisation. Environmental NGOs are those concerned with environmental issues.

Old-Growth Forests

A term often used to refer to forests that are relatively untouched by human activity and so considered to be in need of protection. See Section 4: Forests and Forest Certification for more detail.

Organic

In chemistry - a chemical compound containing carbon (as in 'volatile organic compound'). Commonly used nowadays to mean produced or grown without the use of chemical fertilisers or other artificial chemicals.

Organo-Chloride

A chemical compound containing carbon and chlorine. When chlorine is combined with organic material such as lignin from wood, an organo-chloride compound is formed.

Oxygen De-Lignification

A method in which much of the lignin in wood is removed by oxygen gas. Oxygen delignification reduces the amount of chlorine or chlorine compound needed in the final bleaching stage to produce bleached paper pulp.

Plantation Forest

A term with various definitions, but typically applied to forests which have been specifically planted or seeded in the process of reforestation or afforestation. See Section 4: Forests and Certification for more detail.

Post-Consumer Waste

Post-consumer waste has fulfilled its intended purpose and then been discarded.

Pre-Consumer Waste

Pre-consumer waste is waste from manufacturing operations, and has not yet reached the intended final consumer. It includes material such as trimmings from envelope converters, printers' waste, overruns in production and unsold magazines.

Protected Forests

Forests protected from harvesting by policy.

Pulpwood

Wood cut or prepared primarily for manufacture into wood pulp, for subsequent manufacture into paper, fibre board, or other products.

Recovery Rate

The ratio between paper and paper products recovered and paper consumption.

Regeneration

In forestry terms, regrowth after trees are felled by harvesting or by natural causes. This may occur naturally or by planting.

Roundwood

Wood in its natural state as removed from forests and from trees outside forests.

Selective Cutting

A harvesting system based on progressive thinning, so only selected trees – generally the largest, plus any defective ones – are harvested every five or 10 years.

Silviculture

The art and science of growing trees.

Sludge

In paper recycling, a by-product of recycled paper composed of ash, fines, ink residues and chemicals which are not reused. The amount of sludge varies according to of the type of recovered fibre and the yield of the recycling process.

Softwoods

Timber from cone-bearing trees, such as pine and spruce. Softwood fibers are used in papermaking to impart strength to a sheet of paper

Stickies

In recycling terms, tacky particles coming from the raw material of recovered paper. The main source is adhesives, but they may occur as a result of chemical or physical interactions of other substances during processing. They cause problems such as defects in the finished paper, printability problems and damage to equipment.

Supply Chain

For the purposes of this handbook, all external suppliers involved in the production and distribution of magazines, from raw material to end of life.

TCF (Totally Chlorine Free)

A pulp bleaching process which uses no chlorine or chlorine compounds.

Threatened Species

A species that is likely to become endangered if the factors affecting its vulnerability are not reversed.

VOC (Volatile Organic Compound)

Substances which contain carbon and evaporate readily. They are capable of producing photochemical oxidants (such as ozone and methane) as a result of reaction with oxides of nitrogen in the presence of sunlight.

Wood pulp

Wood reduced to a pulp for subsequent papermaking processes. Can be either mechanically or chemically produced, or a combination.

Woodfree

Papers and boards containing no fibres other than those derived from chemical pulping processes i.e. contains no lignin.

FIPP

The International Federation of the Periodical Press (FIPP), founded in 1925, works for the benefit of magazine and business-to-business publishers around the world. FIPP's mission is to promote nationally and internationally, the common editorial, cultural and economic interests of magazine publishers, both in print and electronic media. FIPP focuses its activities on freedom of the press, intellectual property, information provision, freedom to advertise, freedom of distribution and environmental protection.

Today, FIPP has 177 members in 50 countries which consist of 40 national associations, one regional association (Latin America), 105 publishing member companies and 32 associate members. FIPP serves a global market with a total annual advertising expenditure revenue in the region of US\$70 billion and approximately 110,000 titles based on figures from *FIPP/ZenithOptimedia World Magazine Trends 2003/2004*.

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FAEP

The European Federation of Magazine Publishers (FAEP) is a non-profit organisation representing the interests of the national associations of periodical press publishers and corporate publishing members in Europe. FAEP's mission is "to promote and protect the interests of publishers of the periodical press within the European Union thus ensuring the long-term survival and prosperity of a plural, diverse and economically successful magazine publishing industry in the EU".

Through its 17 member associations (and 11 corporate publishing members), FAEP represents the interests of over 7,000 publishers throughout Europe (the vast majority being small and medium sized enterprises) as well as over 50,000 magazine titles reaching on average 80% of European adults: 300 million Europeans read magazines on a regular, consistent basis, which is reflected by the fact that more than 20 billion copies of magazines are sold every year in Europe.

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