

Recovery and Recycling of Paper and Board



Background

Recovered paper (used paper) is the most important raw material for the UK paper and board industry, representing over 70% of the fibre used to make new paper products in 2019. The Paper Industry is the UK's most successful industrial sector when it comes to recovering and recycling its products. Re-using paper is good national housekeeping as it significantly reduces the amount of material going to landfill and is crucial in providing a valuable raw material, since most paper is made from cellulose fibre from trees and only 12% of the UK is forested. Instead, UK papermakers harvest the 'urban forest'.

The UK industry is proud of its recycling heritage which started over 100 years ago when cotton rags were picked for papermaking. Since then, sophisticated production technologies have been developed that deliver consistent, volume manufacturing to provide for the needs of modern society producing paper for high quality printing and writing, newsprint, packaging and hygiene products. Paper recycling is not a knee-jerk response to environmental pressure. It is an integral part of the UK Paper Industry and it has its own sophisticated infrastructure.

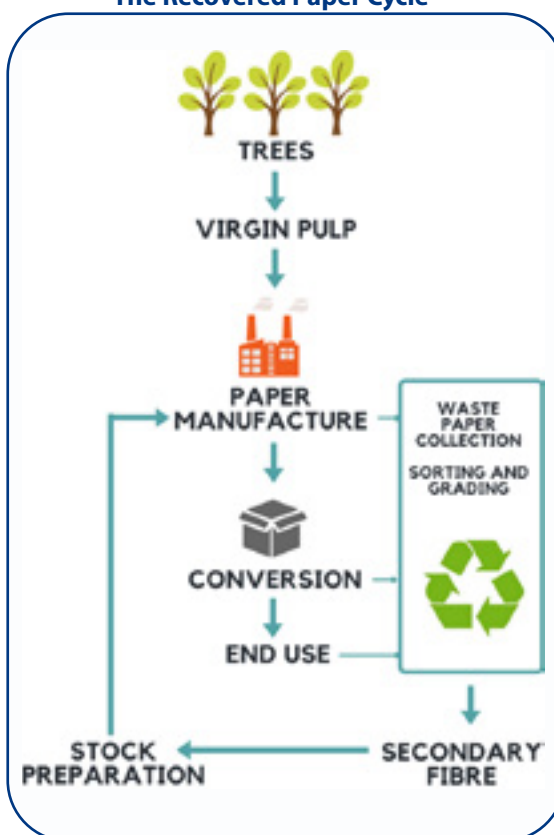
Different paper products are manufactured from different types of recovered paper, so mill buyers will seek out suppliers of the particular grades they need. For instance, cardboard box manufacturers use mostly old cardboard boxes in their manufacturing process whereas, those making newsprint use old newspapers and magazines. Before paper can be sent to a mill for recycling, it needs to be collected, sorted and baled so it can be efficiently transported and stored.

Papermakers buy their raw material for recycling from recovered paper merchants, waste management companies, local authorities and sometimes directly from businesses that produce large volumes of material. Merchants can be mill-owned or may be independent firms specialising in particular grades of recovered fibre or operating within a specific geographical area. Some paper mills may deal directly with Local Authorities, buying the wastepaper collected through kerbside collection schemes.

Types of recovered paper

As well as packaging, junk mail and old newspapers and magazines collected from household schemes, recovered paper is also derived from a range of industrial and commercial sources. These sources often provide the cleanest and most economical source of supply.

The Recovered Paper Cycle



The European Paper Industry recognises five main groups of recovered fibre grades but these can be broken down into 60 sub-categories and are contained and explained within the European Quality Standard BS EN 643. Typically, the lower or ordinary grades are less valuable than the medium or higher grades whilst kraft (virgin fibre) grades are used to provide distinct physical properties to new paper products. The special grades category is a "catch all" containing a range of materials usually regarded as lower grade or problematic for most reprocessors. The grades are as follows:

Ordinary grades: These papers tend to contain a substantial amount of short fibre. Sub-categories include mixed paper

and board, grey board, mixed newspapers and magazines, corrugated paper and board, and sorted graphic paper for de-inking;

Medium grades: This category contains unsold newspapers, printed white cuttings (usually from print rooms), sorted office paper, coloured letters, white books, and coloured magazines;

High grades: Predominantly white papers made from virgin fibres. Subcategories include mixed lightly coloured printer shavings, binders, letters, white business forms, white computer print-out, printed multi-ply board and unbleached board;

Kraft grades: Generally come from brown unbleached packaging materials such as paper sacks and corrugated boxes. Their long, strong fibres make them desirable for use in new packaging and they are often sought after to improve the strength of recycled products for packaging;

Special grades: This a hotchpotch of papers which tend to be uneconomic to sort and so are used in the middle layers of packaging papers and boards. This category also includes laminated boards, wet-strength papers and adhesive labels, often requiring specialist reprocessing equipment.

Uses of recovered paper

The following table shows the quantity of recovered paper used per papermaking sector in 2019 in '000 tonnes:

Type of Paper	UK Production ('000 tonnes)	Recovered Paper Usage ('000 tonnes)
Graphics	918	747
Packaging Papers and Boards (including Corrugated)	1,884	1,775
Tissue	762	379
Others	286	208
Total	3,850	3,109

New pulp still needed

Although recycling makes economic and environmental sense, recovered paper cannot be used in the manufacture of all paper grades, nor can it be used indefinitely. Some fibre is lost to the system and therefore needs to be replaced. Three criteria must be considered:

- 1. strength** - Every time a fibre is recycled it loses some of its strength and the fibre length decreases. After being re-used about six times the fibres can become too short for papermaking;
- 2. quality** - Some grades make little or no use of recycled fibre because they need certain qualities provided only by new pulp. However, recycled papers can have a high

whiteness, smoothness, excellent runability, strength and be compatible with high grade graphics papers required for laser, inkjet and copier printing;

- 3. utility** - It is not possible to recover all paper. For example, cigarette paper, papers put to permanent use in books and artistic works, and others used for hygiene that quite literally go down the pan! Some is un-recoverable because its end-use results in it being bonded with materials unsuitable for recycling or badly contaminated.

Supply and demand

In 2018 global consumption of paper for recycling was in excess of 250 million tonnes. The Paper Industry's demand for recovered paper has risen steadily for the last 15 years and despite recent market volatility, is expected to continue to do so for the foreseeable future. This increase disguises changes in the structure of the market, with increases in consumption of hygiene and packaging products, a decline in demand for graphic papers and newsprint and the movement of factors of production across the globe. In the UK in 2019, 7.4 million tonnes of used paper was recovered for recycling; of which 3.1 million tonnes was delivered to UK paper mills and 4.3 million tonnes exported to other paper producing nations.

In 2019, the overall recycling rate for all paper and board in the UK was calculated by CPI to be 68% with fibre based packaging recycling reaching 81%. The UK's recycling targets for paper and board packaging for 2021 and 2022 are 79% and 83% respectively. The Government has a number of initiatives to promote paper recycling:

Government initiatives and producer responsibility

Producers are now under increased pressure to take responsibility for goods at the end of their lives. This can either be in the form of voluntary agreements or mandatory obligations.

- 1. Packaging:** The Producer Responsibility (Packaging Waste) Regulations require packaging producers to take responsibility for the costs of recovering and recycling the packaging they put onto the market. Obligated companies must evidence a contribution towards the costs of recycling they produce by buying Packaging Waste Recovery Notes (PRNs)¹. Introduced in 1997, this system has worked well to date in helping the UK reach its recycling targets. However, over recent years there has been increasing social and political pressure to reduce the environmental impact of packaging and to replace the PRN system with one that forces the producers of packaging to take responsibility for the full costs of

¹ PRNs or PERNs (Packaging Export Recovery Note) are a marketable instrument issued by reprocessors or exporters that prove a tonne of secondary packaging fibre has been reprocessed. The costs of PRN/PERN fluctuate with market demand and is intended to drive increasing recovery rates.

recovering it from the waste stream. The UK Government is in the process of reforming the system, with a new Producer Responsibility structure scheduled to operate from 2023 onwards. At the time of writing Government is formulating plans and undertaking a series of public consultations to devise and implement the new system.

2. **Newsprint and Graphics:** in the past, the industry and Government have had a number of voluntary agreements to ensure that newsprint and graphical papers are recovered and recycled. In recent years however, the demand for these types of papers has been high and UK manufacturers of newsprint use 100% recycled papers in their raw material furnish. As such, it was deemed unnecessary to continue the voluntary agreements for recycling or recycled content in new products.

European Framework Legislation

Despite the UK's departure from the European Union (EU), it will remain aligned with European waste legislation. The EU Waste Framework Directive provides the overarching legislative framework for the collection, transport, recovery and disposal of waste across Europe, including the UK. Regulations formally enshrining the Directive into UK law were first published in February 2011. In late 2015 the European Commission published its Circular Economy package which builds upon existing directives, seeking to drive resource efficiency and place more demanding targets on recovery and recycling.

In December 2018, the UK Government published its own Resources and Waste Strategy for England which laid out its ambition for future resource management and sought to transpose elements of EU law. The devolved nations have implemented their own waste management programmes. The Welsh government's approach to recycling and its outstanding performance is an exemplar and illustrative of what is achievable.

Waste hierarchy

Contained in Article 4 of the revised Waste Framework Directive is the waste hierarchy which should act as a "priority order" in waste prevention, legislation and policy. This means all decisions on waste policy, infrastructure and management are expected to take the hierarchy into account with the aim of preserving resources in use for as long as possible. The hierarchy is as follows:



Recycling logos



Historically, a range of different logos and markings have been used to indicate the recyclability of products and packaging. These include the



mobius loop, the green dot and the recycle mark. However, these marks can mean different things and research suggests they not widely understood by consumers.



In an attempt to provide clarity, the UK Government has indicated that it intends to introduce a binary marking system on packaging to indicate recyclability, taking into account whether a product is technically recyclable, whether it can be collected and sorted and whether, once collected, there is a market for it. This is likely to be implemented during the revision of the EPR system in 2023.

Industry has responded and in March 2009 a consortium of packaging supply chain stakeholders formed OPRL Ltd with the aim of providing a single, easily comprehensible pack marking system. By mid-2020 it boasted membership of nearly 600 companies encompassing for example over 95% of UK grocery sales.



The OPRL system is increasingly widely recognised. As a not for profit member organisation, member businesses are allowed to use their logos if packaging meets the technical criteria for recyclability, is collected by over 75% of local authorities, can be sorted and reprocessed using current infrastructure, and there is an aftermarket.

National Waste Plans

As referred to above, the devolved nations have their own national waste strategies. These can be found as follows:

England: <https://www.gov.uk/government/publications/resources-and-waste-strategy-for-england>

Scotland: <https://www.gov.scot/binaries/content/documents/govscot/publications/strategy-plan/2010/06/scotlands-zero-waste-plan/documents/00458945-pdf/00458945-pdf/govscot%3Adocument/00458945.pdf>

Wales: <https://gov.wales/sites/default/files/publications/2019-05/towards-zero-waste-our-waste-strategy.pdf>

Northern Ireland: <https://www.daera-ni.gov.uk/consultations/Waste-Management-Plan-for-Northern-Ireland>

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