

STEEL RECYCLING

Steel Scrap Arisings and Recycling Rates

Steel is used in a wide range of manufactured goods, including construction materials, road vehicles, electrical and household appliances and steel packaging.

UK production of crude steel has fluctuated between 13.5 and 18.9 million tonnes since 1981. In 2001, the UK produced 13.5 million tonnes of crude steel, utilising 3.62 million tonnes of ferrous scrap.

There are two types of scrap steel: 'new scrap' which arises in industry in the form of off-cuts, stampings, turnings etc. and 'old scrap' derived from end-of-life products. Old scrap includes heavy scrap from large construction or railway equipment and light scrap, which includes scrap vehicles, packaging and white goods.

It is difficult to estimate the overall recycling rate for steel. In order to calculate a recycling rate, it is necessary to know the overall quantities of steel in the waste stream. Steel is used in a range of products and it can be many years before these products are scrapped and become available for recycling. It is generally estimated that the UK recycles around 60% of steel which enters the waste stream.

The UK imports and exports steel scrap. Information on UK imports and exports for the years 1994 to 2001 is shown in the following table.

	UK Imports		UK Exports	
	Tonnes	Value £ per tonne	Tonnes	Value £ per tonne
1994	101,500	294.1	3,600,100	92.7
1995	200,500	372.1	3,463,700	102.0
1996	250,100	339.0	3,430,900	88.9
1997	228,400	301.3	3,602,900	80.8
1998	179,700	242.3	3,196,900	75.1
1999	151,800	270.2	3,547,800	59.5
2000	191,216	376.5	4,377,000	N/A
2001	153,014	320.2	4,791,000	N/A

Steel packaging such as food and drinks cans, aerosols, steel drums, strapping and wire has a relatively short lifetime. In 2001, businesses obligated under the Packaging Regulations placed 634,381 tonnes of steel packaging on the UK market and the total amount of steel packaging including non-obligated businesses was estimated to be 750,000 tonnes. Steel packaging waste, therefore, represents a small proportion of the total amount of steel in the waste stream. In 2001, the UK recycled 278,000 tonnes of steel packaging, equivalent to a recycling rate of 37%.

Steel Recycling Operations

The recycling of steel scrap is an integral part of the steel manufacturing process. There are two methods of steel manufacturing: basic oxygen furnaces (BOF) and electric arc furnaces (EAF). In BOF the scrap utilisation rate is around 25%, depending on the plant and the product, whereas EAF utilise a high rate of steel scrap, almost 100%. In 2001, 76% of UK production of crude steel was

via BOF and 24% was via EAF. There are a number of factors which effect the utilisation rate of scrap metal. These include the overall level of production, production method and the levels of imports and exports of steel scrap.

UK steel production levels have recently been affected by the changes in the UK steel industry. There are five major Corus (formally British Steel) steel manufacturing plants and two other plants operating in the UK. Corus have recently undergone restructuring, selling two metal recycling yards and closing one of two EAF steel furnaces at its Aldwarke (Rotherham) plant. In addition, two plants operated by Allied Steel and Wire in Cardiff and Sheerness have gone into receivership. This has reduced overall production and corresponding demand for ferrous scrap.

The infrastructure for the collection of scrap metal from industry is well developed. Scrap ferrous material is collected, sorted and sheared or baled for onward transfer to steel reprocessing plants. The magnetic properties of steel allow it to be separated quickly and efficiently from non-ferrous contaminants. The ferrous metal industry works on an established set of specifications allowing iron and steel material to be sorted and graded prior to reprocessing.

Steel waste arisings in the household waste stream are mainly from large household appliances and packaging. Most large appliances and bulky metal wastes are fed through to the scrap industry via either local authority collection or Civic Amenity sites. Steel packaging is more difficult to segregate, although both kerbside collection schemes and can banks are becoming more widespread. Steel cans do not require pre-treatment to remove the tin. The vast majority of the steel cans which are recycled in the UK are recycled in steelmaking furnaces without having been de-tinned beforehand. However, there are detinning operations in the UK run by AMG Resources, which has two plants in Llanelli and Hartlepool processing around 25,000 tonnes post-consumer metal packaging material. The technology operated by the company recovers not only the steel and tin but also the aluminium from bi-metallic cans.

Technical and Economic Barriers to Recycling Steel

Significant increases in the volume of scrap consumed in the UK steel industry will not be achieved without increases in the volumes of steel produced and particularly steel produced by the EAF process. Industry has said that export markets for scrap metal have been affected by the strength of the pound against the Euro. Steel exports to non-EC countries are growing.

Unlike other recycled materials such as plastics or paper, the quality of recycled steel does not deteriorate during the recycling process and the resulting new material is indistinguishable from virgin material. In fact, the use of scrap is an integral part of the steel manufacturing process and steel has always contained a high percentage of scrap. Since all steel is made using a significant proportion of scrap, steel which is 100% virgin material does not exist.

One barrier to increasing the recycling rate of steel scrap is the cost of collection and this barrier particularly applies to steel packaging. There are a number of initiatives which aim to help the UK achieve a high and economically viable level of steel packaging recycling. These are as follows:

Can Route

Can Route was established in June 1999 by the, then, British Steel Packaging Recycling Unit (now Corus Steel Packaging Recycling). It is designed to help local authorities sell and transfer cans from the household waste stream. *Can Route* established 13 regional centres, where local authorities can deliver their waste. In the first three years of operation, since June 1999, *Can Route* collected nearly 20,000 tonnes of steel cans for recycling.

Can Banks and Kerbside Collection

Can Route is supported by collection of steel cans through can banks and kerbside collection schemes. The Save-A-Can scheme operates around 2000 can banks nation-wide which accept both steel and aluminium cans together and a further 3000 can banks are estimated to be operating independently from this scheme.

Kerbside collection of steel packaging has also risen in recent years. According to a survey commissioned by Corus Steel Packaging Recycling, steel packaging kerbside collection rose from 7,455 tonnes in 1997/98 to 19,000 tonnes in 2000/01. In total, it is estimated that 30,000 tonnes of steel were collected through can banks and kerbside collection in 2000/01

Government Initiatives & Legislation

The EC Directive on Packaging and Packaging Waste is implemented in the UK through the Producer Responsibility Obligations (Packaging Waste) Regulations. The Directive required the UK to meet various objectives including the recovery of 50% of all packaging waste with a minimum recycling target of 15% recycling of individual materials, including steel, by 2001. Steel exceeded its material-specific target, achieving a recycling rate of 37%. The Directive targets are currently being reviewed and are likely to be increased. The UK Regulations have placed obligations on certain businesses in the packaging chain to ensure the recovery and recycling of packaging waste.

Accredited reprocessors of packaging are able to issue Packaging Waste Recovery Notes (PRNs) as evidence that recovery/recycling of packaging waste has taken place. Revenue from the sale of PRNs can be reinvested in recycling, for example in improving collection schemes. The leading steel supplier to the steel packaging chain, Corus, has directed revenues from the sale of PRNs to the further development of community collection schemes.

Government Programmes

The *Waste and Resources Action Programme (WRAP)* was established in 2001 to promote sustainable waste management. WRAP's particular focus is creating stable and efficient markets for recycled materials and products.

WRAP is focusing on the 100 million tonnes of waste of commercial, industrial and municipal waste. There are seven programmes - three focus on generic areas – financial mechanisms, procurement and standards and specification. It also focuses on four specific materials – paper, glass, wood and plastic.

Further Contacts

Further information and publications on these issues and initiatives are available from the following sources:

Government Contacts

Department of Trade and Industry
Recycling Policy Section
Sustainable Development Directorate
151 Buckingham Palace Road
London SW1W 9SS
Tel: 020 7215 1036 Fax: 020 7215 5835
Web Site: www.dti.gov.uk/sustainability

Department of the Environment, Food and Rural Affairs
Waste Strategy Division
Ashdown House
123 Victoria Street
London SW1E 6DE
Tel: 020 7944 3000 Fax: 020 7944 6409
Web Site: www.defra.gov.uk

The Environment Agency
Head Office
Rio House
Waterside Drive, Aztec West
Almonsbury
Bristol BS32 4UD
Tel: 01454 624411 Fax: 01454 624409
Web Site: www.environment-agency.gov.uk

The Waste Resources Action Programme (WRAP)
The Old Academy
21 The Horse Fair
Banbury
Oxon OX16 0AH
Tel: 0800 100 20 40 Fax: 01295 819911
Web Site: www.wrap.org.uk

Industry Contacts

Corus Steel Packaging Recycling
Corus
Port Talbot
South Wales SA13 2NG
Tel: 01639 872516 Fax: 01639 872693
Website: www.corussteelpackagingrecycling.com

The UK Steel Association
Broadway House
Tothill St
London SW1H 9NQ
Tel: 0207 222 7777
Web Site: www.uksteel.org.uk

British Metals Recycling Association
16 High street
Brampton
Huntingdon
Cambridgeshire PE28 4TU
Tel: 01480 455 249 Fax: 01480 453 680
Web Site: www.britmetrec.org.uk

Further Reading

Waste Strategy 2000 - England and Wales
(Part I and Part II)
Department of the Environment, Transport and the Regions
(DETR), 2000

British Metals Federation - Annual Report and Yearbook
British Metals Federation, 2000

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