TYRE RECYCLING

Tyre Waste Arisings and Recycling Rates

The Used (formerly Scrap) Tyre Working Group (UTWG) reported that, in 1999, the overall used tyre recovery rate increased 3% from the 1998 level to 73%. However, this needs to be seen in light of lower used tyre arisings and a slightly reduced tonnage of tyres recovered. Recovery routes include reuse, retreading, recycling, landfill engineering and energy recovery. The key figures are presented in the table below:

Used Tyre Summary Data

	Tonnes	%
Overall Waste Arisings	436 000	
Overall Recovery	320 000	73
Reuse	62 000	14
Retreading	74 000	17
Recycling	83 000	19
Landfill Engineering	31 000	7
Energy Recovery	70 000	16

It is difficult to predict with any accuracy future levels of used tyre arisings and the levels of different types of recovery. However, road traffic is predicted to grow significantly over the next twenty years (between 29 and 63 per cent according to DETR forecasts), and it is likely that used tyre arisings will also increase. New arisings figures, together with future projections, are due from the DTI in 2001.

Tyre Recycling Operations

Used tyres are gathered from a number of sources, including scrap yards, garages and specialist tyre retailers. The tyre disposal and recovery route is complex with many different market participants. The 1999 interim report of the UTWG provides further detail on market structure and the numbers of companies involved.

Used tyres, known as casings, are sorted for use in one of four options: retreading; re-use; material recycling; and energy recovery.

Retreading

The UTWG favours retreading as the first line recovery option since it is considered to make the best use of the waste tyre resource. Manufacturing a retread tyre for an average car takes 4.5 gallons less oil than the equivalent new tyre, and for commercial vehicle tyres the saving is estimated to be about 15 gallons per tyre. The first stage of retreading is a primary inspection, from which as few as 15% proceed to stage two. The others are sent for one of the other options described below. In 1999, Colway, the UK's biggest retread firm, processed one million tyres, while rejecting a further four million.

In the second stage, the old tread of the tyre is mechanically removed by a process called buffing. Application of new tread follows, using one of two methods: pre-cure or mould-cure. In the pre-cure

process, the tread rubber has already been vulcanised with the new tread design prior to application. In the mould-cure process, unvulcanised rubber is applied to the buffed tyre before the tread is vulcanised. The new tyre is then inspected again, before being trimmed (to remove any excess rubber) and painted. Retreads have to be marked according to the British Standard BS AU 144f:1988.

Re-use

Some used tyres are perfectly suitable for further use on vehicles. Tyre Safety Regulations apply to the sale of part-worns. The Tyre Industry Council (TIC) has developed a voluntary code of practice for so-called 'part-worns' under its Responsible Recycler scheme. Regulations also apply to part-worns. These require that tyres have at least 2 mm of tread across the breadth of the tyre and that tyres are clearly marked as a part-worn at the point of sale.

Alternative uses for tyres are numerous and miscellaneous. Between 1998 and 1999 there was a 20% growth in the use of tyres as leachate drainage systems for landfill engineering. Other uses account for about 20 000 tonnes of arisings, and these include dock fenders, playground swings and artificial reefs. Around 10 000 tonnes of tyres are exported to other countries for use as part-worns or in overseas retread operations.

Material Recovery

The number of companies shredding and recycling tyres is increasing although the available market for the shredded material remains relatively stable. The most widespread material recovery process in the UK, ambient grinding, produces a range of crumb sizes through a progressive size reduction process. The energy used to break up the tyres increases as the particle size decreases. Uses for rubber crumb include surfacing for sports, playgrounds and roads, carpet underlay, street furniture and acoustic barriers, as well as incorporation into new tyres. A trial stretch of road surface containing rubber crumb has been performing well since being laid in June 1999, and the tyre industry sees this as a significant possible future market.

Energy Recovery

There are advanced proposals for two tyre pyrolysis plants: one in Staffordshire which would utilise 65 000 tonnes of used tyres and generate approx. 15.5 MW electricity, another in Derbyshire would take around 60 000 tonnes of tyres.

An alternative energy recovery option is the incineration of tyres in cement kilns. The UTWG believes this can represent the Best Practicable Environmental Option (BPEO). Three cement manufacturers operate kilns, at around twenty UK locations, although not all of these are suitable for tyre use. Tyres are able to replace up to about 25% of the coal which would otherwise be used and also reduce nitrogen oxides emissions. The UTWG predicts the current capacity of cement kilns, of around 30 000 tonnes of tyres per annum, will grow to around 80 000 tonnes in the near-term, with a further potential capacity beyond that. In the longer term, the cement industry have indicated that they could handle around half of the UK's total tyre arisings. The UTWG believes this recovery route will be key to achieving 100% tyre recovery by 2006.

Disposal

Around 120 000 tonnes of tyres per annum are disposed to landfill, stockpiled or illegally dumped. The industry is taking steps (see below) to see that tyres are not diverted from landfill to illegal dumping.

Technical and Economic Barriers to Recycling Tyres

Despite the widespread use of retreads in the commercial, earthmoving and (in particular) aircraft industries, the continuing decline in the passenger car retread market has forced the closure of a

number of retread companies. Despite the improved quality of retreads, sales have dropped by over 50% in the past five years. Traditional key selling points for retreads were that they were significantly cheaper. However, growth in the budget tyre market, where prices may be marginally higher than retreads, has significantly affected the retread business. In addition, retailers' margins are often higher on budget tyres. There is also a continuing public perception that retreads are of poor quality.

As previously mentioned, burning tyres in cement kilns is one of the key options for recycling tyres. The Environment Agency stated in their November 1998 report 'Tyres in the Environment' that, 'from an environmental viewpoint, cement kilns are a good option for the energy recovery of used tyres'. However, several pressure groups, including Friends of the Earth and 'The Campaign Against the New Kiln', claim that dioxins, particulates and similar materials are an unacceptable hazard from kilns. These concerns are taken into consideration during the risk assessment process before the authorities grant permission for a kiln to burn tyres.

Industry Initiatives

Tyre Industry Council (TIC)

The TIC has developed a 'Responsible Recycler Scheme', which covers companies handling around half the UK's annual used tyres. The scheme is designed to ensure that the reuse and recycling of used tyres complies with legal requirements. Scheme members are subject to annual independent performance audits for their re-accreditation and that of their reprocessors. There are also guidelines on reuse and recycling techniques, site approval procedures and a code of practice covering the trade in part-worns.

Government Initiatives and Legislation

Landfill Directive

The EC Landfill Directive came into force on 16 July 1999, and it contains specific targets for tyres. The Directive requires the UK to prohibit landfilling of whole tyres by 2003 and the landfilling of shredded tyres by 2006 in new landfill sites. The timetable for existing landfill sites in subject to confirmation.

In January 1998, the Government asked the UTWG to recommend its preferred means of ensuring the UK will meet these requirements. The Group favoured a market-based approach, although recognising that this may not guarantee total compliance. The industry and Government continue to work alongside each other, through the UTWG, to develop a market-based approach.

End-of-Life Vehicles Directive

The End-of-Life Vehicles (ELV) Directive aims to increase the re-use, recycling and recovery of ELVs, starting with a recovery target of 85% by 2006. The UK Government is currently considering what steps need to be taken to ensure the UK meets the Directive's targets.

Around 5% of the weight of an ELV is rubber, of which about 3.5% comes from the tyres. Since the reuse and recovery of tyres is relatively well developed, tyres can be expected to play an important role in achieving the targets.

Incineration Directive

The EC Waste Incineration Directive is intended to prevent the or reduce negative effects on the environment caused by the incineration and co-incineration of waste. Cement kilns do not fall under the auspices of this Directive unless they use waste (such as tyres) as a fuel. The stricter NOx emissions limits may be a particular difficulty for wet-process kilns wanting to incinerate tyres, though the impact may be limited as the majority of kilns use a dry process.

Government Programs

In October 1999, the DTI launched a £1.4m Recycling Programme with the aim of securing and maintaining increases in demand for secondary raw materials by reducing or removing some of the technical and market obstacles which inhibit the use of recyclate by manufacturing industry. A number of applications for support from tyre related projects were made under this programme.

Further Contacts

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

Government Contacts

Department of Trade and Industry (DTI)
Environment Directorate
Recycling Policy Section
151 Buckingham Palace Road
London
SW1W 9SS
Tel: 020 7215 1860
Fax: 020 7215 5860
Web Site: www.dti.gov.uk

Department of the Environment, Transport and the Regions (DETR)
Waste Strategy Division
Ashdown House
123 Victoria Street
London
SW1E 6DE
Tel: 020 7944 3000
Fax: 020 7944 6409
Web Site: www.detr.gov.uk

The Environment Agency (EA)
Head Office
Rio House
Waterside Drive, Aztec West
Almondsbury
Bristol
BS32 4UD
Tel: 01454 624400
Fax: 01454 624409
Web Site: www.environment-agency.gov.uk

Industry contacts

The Tyre Industry Council (TIC)
6 Bath Place
Rivington Street
London
EC2A 3JE
Tel: 020 7323 0771
Web Site: www.tyresafety.co.uk

Secretary to the Government-Industry Used Tyre Working Group
Environment Directorate
Department of Trade and Industry
151 Buckingham Palace Road
London
SW1W 9SS
Tel: 020 7215 1860
Web Site: www.tyredisposal.co.uk

Retread Manufacturers Association (RMA)
2nd Floor, Federation House
Station Road
Stoke-on-Trent
ST4 2TJ
Tel: 01782 417777
Fax: 01782 417766
Website: www.tyres-online.co.uk/rma/

British Rubber Manufacturers Association
6 Bath Place
Rivington Street
London
EC2A 3JE
Tel: 020 7457 5040
Fax: 020 7972 9008

Imported Tyre Manufacturers' Association
1 Pindock Mews
London
W9 2PW
Tel: 020 7289 1043
Fax: 020 7286 9859

Further Reading

Fourth Annual Report of the Used Tyre Working Group, 2000

1999 Interim Report of the Used Tyre Working Group, 1999

Tyres in the Environment – Environment Agency Report, 1998

The Waste Strategy 2000: England and Wales (DETR), 2000

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