

ACCESSING INTERNATIONAL MARKETS

# UK WASTE MANAGEMENT AND RECYCLING: A WORLD-CLASS INDUSTRY

*Hit the world running* UK

# INTRODUCTION

This brochure highlights the UK's strengths and experience in the waste management and recycling industry, part of the country's transition to a low carbon economy.

Other brochures are available that provide an overview of the UK's environmental and water sector:

- Waste to energy
- Contaminated land and remediation
- Air pollution control
- Environmental instrumentation, monitoring and analysis
- Water and wastewater.



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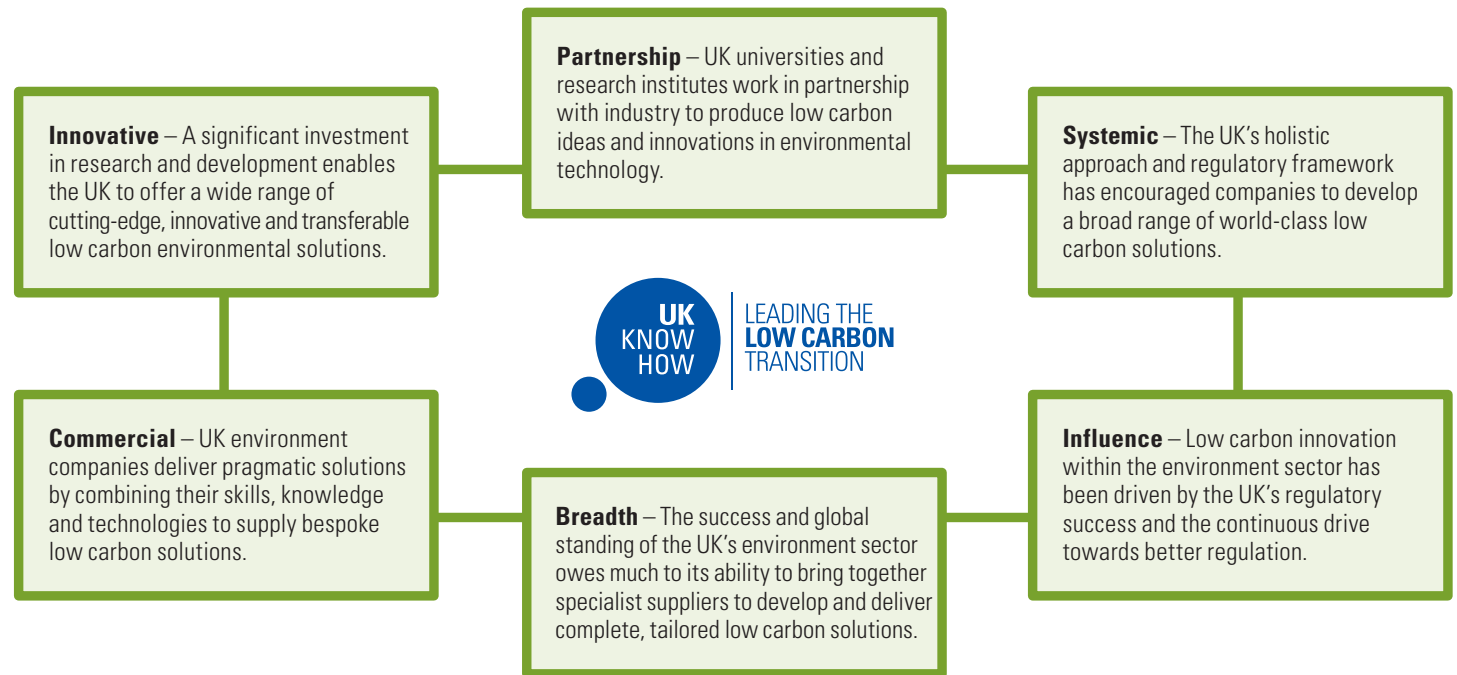
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The UK is rapidly becoming a global hub for world-class low carbon solutions. Within the environment and water sector, the UK offers knowledge, technology and experience to bring about incremental and sizeable reductions in carbon emissions – a low carbon consultancy

on a big scale. With a progressive business and policy environment that fosters carbon reduction, the UK is designing and developing the solutions that will increasingly prove valuable to international partners looking to reduce and manage their own emissions.



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The UK waste management industry has experienced growth of 64 per cent since 2003. The industry now employs 70,000 people in some 3,000 companies, with an annual turnover of £9 billion. It is one of the UK's most sophisticated and rapidly developing industries.

The UK produces in excess of 400 million tonnes of waste per year. This waste is produced from a variety of sources, including approximately a quarter from mining and quarrying and nearly a half from households, commerce and industry. To deal with this effectively, the UK waste management sector comprises a diverse range of services, from street cleaning through to the final treatment and disposal of hazardous materials. There is an increasing emphasis in the UK on continuous innovation to ensure that materials are no longer discarded, but instead recovered and re-used, thus saving natural resources.

The UK has responded with determination to the challenges posed by climate change and concerns about energy security. It is increasingly adopting an integrated approach to waste management and managing all its wastes in an environmentally sound manner, in accordance with the legislation created within the European Waste Framework Directive.

The UK's policy drivers and regulatory framework have encouraged waste management companies to develop a range of world-class low carbon solutions and ensure the industry is well positioned to export its capability in equipment manufacture and service provision.

## THE UK OFFERS BESPOKE SOLUTIONS FOR INTERNATIONAL MARKETS

Commercially driven and entrepreneurially minded, the UK waste management industry is ready to respond quickly to business opportunities overseas. Offering world-leading consultancy, as well as cutting-edge products and technology, its adaptable and innovative solutions can help to address any waste management challenge, wherever it may be in the world.

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The UK is well placed to advise and supply overseas customers with bespoke low carbon waste technologies and solutions. The UK waste management industry has developed a broad spectrum of innovative technologies and expertise in the following areas:

- Waste collection systems and services
- Material recycling facilities
- Mechanical Biological Treatment (MBT)
- Composting and anaerobic digestion
- Landfill engineering
- Waste to energy.

The UK waste management industry is a world leader in the application of advanced landfill technologies such as monitoring systems, leachate control and the capture of landfill gas for the generation of renewable electricity – expertise that it is exporting across the globe.

The UK has a strong capability in the planning and introduction of recycling systems, including the roll out of municipal recycling schemes in areas of historically low provision, and the selection and application of suitable technologies.

The UK has developed expertise in treating biodegradable wastes, traditionally by means of composting and increasingly through the use of complementary techniques such as anaerobic digestion and mechanical biological treatment.

The UK has enhanced its global waste to energy offer through the development of thermal treatments such as pyrolysis and gasification.

Resulting from its extensive experience of landfill, waste collection, recycling, and waste to energy, the UK is uniquely placed to offer advice and guidance on Waste Life Cycle Risk Modelling, particularly important for the funding of new waste schemes with an anticipated life span of 25 years or more.



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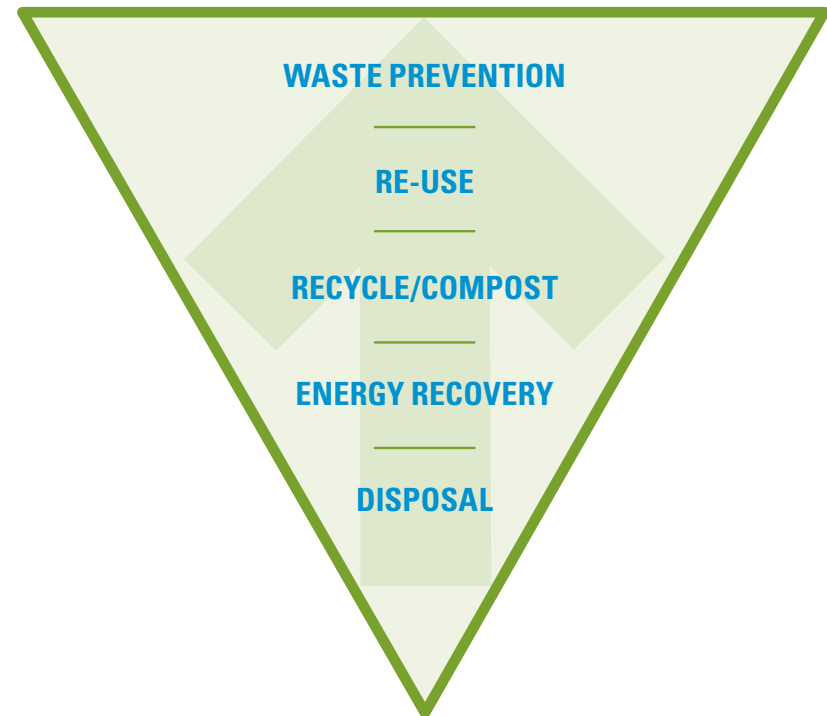
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## THE UK REGULATORY FRAMEWORK HAS HELPED TO DEVELOP A SOPHISTICATED AND INNOVATIVE WASTE MANAGEMENT INDUSTRY.

The single most important piece of European legislation driving change is the Waste Framework Directive, revised in 2008. It sets recycling rates for 2020 (50 per cent for households and 70 per cent for construction and demolition waste), strengthens provisions on waste prevention and sets out a clear five-step hierarchy for waste management options.

Within the Framework, the Landfill Directive, the Integrated Pollution Prevention and Control (IPPC), End-of-Life Vehicles (ELV), Packaging and Waste Electrical and Electronic Equipment (WEEE) Directives have specifically shaped the future direction of the UK's waste management industry.



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As a result of significant investment both by the private and public sector in research and development, the UK is able to offer a wide range of cutting-edge, innovative and transferable low carbon waste management solutions. The UK offer is a mix of traditional waste management products and consultancy services and more niche technologies such as those that recover ash from coal-fired power stations. Amongst the new technologies on offer are:

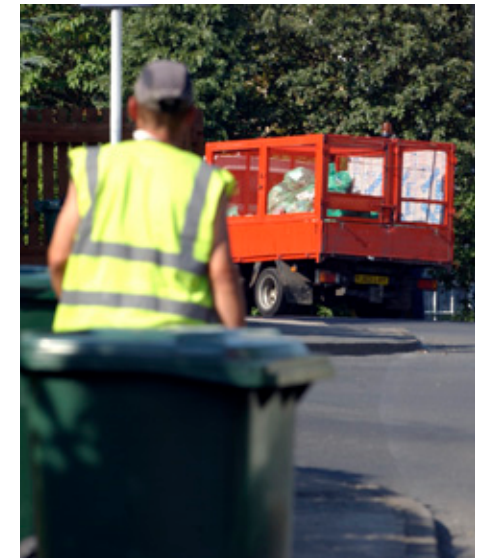
- Anaerobic Digestion (AD): an emerging technology that supplies sustainable energy and organic material as a fertiliser.
- Mechanical Biological Treatment (MBT): recovers recyclables and processes the organic fraction of the waste stream.

- Pyrolysis, gas plasma and gasification (advanced thermal treatments): the chemical decomposition of organic materials by the use of high temperatures with little or no oxygen present.

The UK has identified the potential capacity in the next 10 years for the construction of facilities and associated infrastructure. This would include up to 1,000 AD plants, a mix of some 180 or more biological and non-biological thermal treatment plants with annual capacities ranging between 30,000-80,000t of waste input, as well as a large number of often associated MBT plants.

To respond quickly to business opportunities overseas, UK expertise can analyse particular country requirements and deliver bespoke integrated waste management solutions in accordance with local legislation and fiscal drivers.

**UK GREENHOUSE-GAS EMISSIONS FROM WASTE MANAGEMENT ARE DOWN 62 PER CENT FROM 1990 LEVELS AND WILL FALL BY AT LEAST 80 PER CENT BY 2050.**



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The early adoption of waste policy and regulatory reform developed in partnership with trade associations and their members has seen the UK waste industry actively embracing and rapidly moving to a low carbon future. Innovation, driven by academia and other stakeholders, continues to increase diversion of waste from landfill, and improves recycling and recovery rates.

The public and private sectors have worked together to identify not just current waste streams but also how such innovation will alter trends in recycling and recovery rates during the lifetime of the selected waste solution, to ensure waste infrastructure selection is appropriate both now and in the future. This partnership has extended to the legal and financial services sectors to ensure that the right framework is in place to deliver the selected waste services to the benefit of all.

This partnership approach has helped to develop market-leading financial systems such as Public Private Partnerships (PPP), which will be a key mechanism in the delivery of around £15 billion in new waste management facilities in the UK by 2020.

This world-class combination of waste, legal and financial solutions has assisted the UK waste industry to achieve international success, helping deliver practical locally focused solutions on the ground.

The partnership approach is helping the drive towards a low carbon, low waste industry characterised by less waste, more material recovery, less landfill and more energy from waste.

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## KEY ORGANISATIONS

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### Chartered Institution of Wastes Management (CIWM)

One of the UK's leading professional bodies for waste and resource management.

[www.ciwm.co.uk](http://www.ciwm.co.uk)

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### Environment Agency

A public body committed to improving the environment and sustainable development.

[www.environment-agency.gov.uk](http://www.environment-agency.gov.uk)

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### Environmental Services Association (ESA)

A major UK trade association for the waste management and secondary resources industry.

[www.esauk.org](http://www.esauk.org)

# ADVANCED LANDFILL ENGINEERING HELPS DELIVER A BETTER LIVING ENVIRONMENT

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SKM Enviros provides specialist technical and design services for leachate management and treatment from landfills. Their services were recently used on the 120Mm<sup>3</sup> Bukit Tagar Landfill, the first engineered sanitary landfill in Malaysia and one of the largest new landfills in the world.

SKM Enviros designed the leading-edge, fully automated leachate management and treatment system, capable of treating up to 1000m<sup>3</sup> of strong leachate per day and comprising:

- holding ponds for leachate storage and anaerobic pre-treatment;
- balancing tanks for leachate flow control and distribution;
- four large sequencing batch reactor lagoons providing main biological treatment;
- a dissolved air flotation tank for the removal of residual suspended solids and colloidal material;
- a sludge-thickening tank for regular sludge removal;
- fully computerised and automated operation of pumps, electrically actuated valves, dosing mechanisms and aerators, via the SCADA system.

A similar approach was adopted by SKM Enviros to design and commission a large leachate treatment plant as part of the remediation of the 80m high Taman Beringin Landfill, in an urban area within sight of the famous Kuala Lumpur Petronas Towers, allowing a discharge of treated leachate to be made safely into a nearby watercourse.

Technical Director Howard Robinson says: "Following our success on the two large landfill projects, we were commissioned to design leachate management systems at 16 very large old dumps across Malaysia, many containing more than 20 million tonnes of waste. We have recently run eight pilot-scale treatment trials on leachates from half of these sites."

[www.enviros.com](http://www.enviros.com)

# INDUSTRY CUTS ITS EQUIVALENT CO<sub>2</sub> EMISSIONS THANKS TO UK RECYCLING EXPERTISE

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Burning coal in coal-fired power stations creates a legacy of large deposits of waste fly ash destined for storage in long term landfill or ash mountains. By failing to recover, recycle and reuse this waste stream industry is simply adding to the billions of tonnes of fly ash already discarded around the world.

UK company RockTron has developed a truly innovative solution to recycle 100 per cent of the ash into valuable eco-minerals for use in industries such as construction, automotive and aerospace. The technology, which can benefit both stockpiled and new ash, enables the remediation of such ash stockpiles. This eliminates the need for future large-scale storage at current coal-fired power stations and, by creating new eco-minerals, helps increase the recycled content of manufactured products, helping to conserve natural mineral resources. It represents one of the most significant low carbon solutions available to major polluting industries, offering significant reductions in final product CO<sub>2</sub> emissions.

With such environmental benefits, RockTron's technology, which recently received The Institution of Chemical Engineers' Outstanding Innovation medal, is in high demand internationally, with plans to build ash-recycling facilities in China, Malaysia, Poland, Russia and the USA.

[www.rktron.com](http://www.rktron.com)

# HOW UKTI CAN HELP

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UK Trade & Investment (UKTI) is the government department that helps UK-based companies succeed in the global economy. We also help overseas companies bring their high-quality investment to the UK's dynamic economy – acknowledged as Europe's best place from which to succeed in global business.

UKTI offers expertise and contacts through its extensive network of specialists in the UK, and in British embassies and other diplomatic offices around the world. We provide companies with the tools they require to be competitive on the world stage.

UKTI is committed to helping companies across the globe enhance their awareness and understanding of the many products and services offered by UK suppliers.

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**THE UK HAS REDUCED THE AMOUNT OF BIODEGRADABLE WASTE SENT TO LANDFILL FROM AROUND 16 MILLION TONNES IN 2001 TO LESS THAN 11 MILLION TONNES IN 2008, WITH A TARGET OF 5 MILLION TONNES BY 2020.**

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