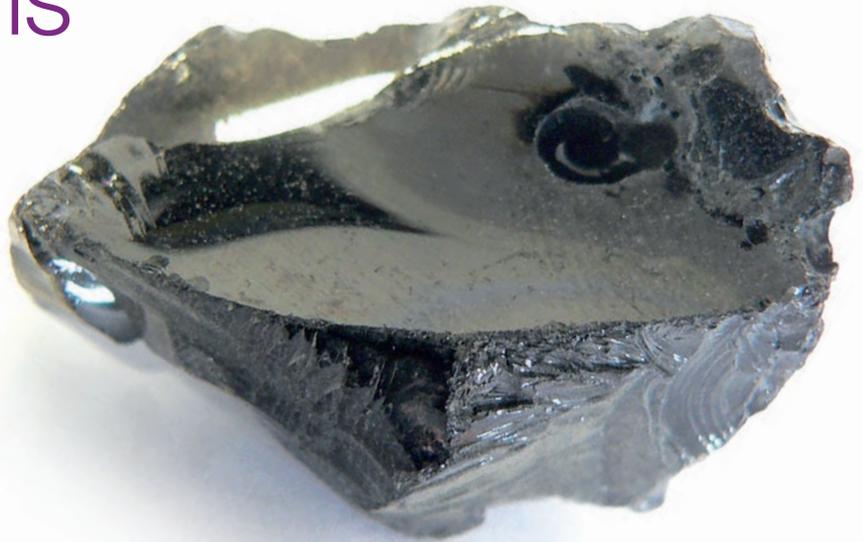


## Hazardous waste cleans up its act

Technology developed by a UK company is eliminating the country's fastest growing hazardous waste and recycling it into products like bricks and tiles for the construction industry.



### The need

Instead of landfill, incineration is being used increasingly in the UK to dispose of waste while recovering energy. The processes for controlling air pollution at these facilities creates a hazardous waste that represents approximately 3.5% of the original waste input by mass.

Around 170,000 tonnes of Air Pollution Control (APC) residue, the hazardous by-product of incineration, is created every year in the UK – enough material to fill over 100 Olympic-sized swimming pools.

Current landfill based methods of managing APC residues, which contain volatile heavy metals, are not sustainable and increasing reliance on energy-from-waste means that a more integrated solution is required.

### The results

As the UK tries to make waste disposal more environmentally friendly by incinerating it rather than burying it in the ground, the amount of hazardous residue caused by Air Pollution Control systems is increasing.

With the help of £1.19m of funding from the Technology Strategy Board, Tetronics and its partners have developed a new solution based on 'plasma arc technology', which would allow one of the UK's largest growing hazardous waste streams to be converted into an inert material that can be recycled into useful products.

Plasma arc technology works at very high temperatures to recover difficult to treat wastes. The process is designed first to recover any valuable material from the waste, then the depleted residue itself is converted into a reusable product. The technology can transform the residue from a hazardous powder to an inert stone-like material that can form new materials including glasses, glass-ceramics and geopolymers,

that have potential to be used in the manufacture of bricks, floor and roof tiles and other construction products.

The chlorine in the waste, which is partially responsible for the environmental hazard, can also be recovered as hydrochloric acid and sold.

The technology developed in the project is now ready to be used at full commercial scale of around 30,000 tonnes per year, and the funding has increased Tetronics' access to a growing market. The future business potential for Tetronics' plasma technology is huge. The current (2009) market value of APC residue landfill disposal is some £28m a year, and with rising volumes and increasing levels of landfill tax this is likely to double within three to six years. With the capacity to clean up the process of incineration, planning applications for more treatment facilities may also be speeded up, resulting in bigger profit margins for many UK companies.

## Market potential

The total cost of sending the UK's APC residue to landfill was around £24.5m last year and is set to increase by 15% in 2010.

At the same time, the UK is under increasing pressure to meet stringent European environmental and landfill avoidance targets under their obligations on climate change.

To meet these targets and to encourage less use of landfill, the UK is increasing its landfill tax progressively to £72 per tonne in 2013, which makes any technology that can help companies reduce what they send to landfill, commercially advantageous.

Plasma arc technology is finding ever wider applications in the treatment of hazardous waste materials. Tetronics' use of the plasma technology is already attracting interest from major businesses holding significant market share, including UK local authorities and private waste management companies.



'Plasma arc technology is a viable solution to the UK's largest hazardous waste problem and has great business and environmental potential.'

Dr David Deegan, Technical Director:  
Environmental, Tetronics.



## Technology Strategy Board

Driving Innovation

Collaborative research and development projects are one of the tools that the Technology Strategy Board uses to drive innovation in the UK. The Technology Strategy Board is a business-led executive non-departmental public

body, established by the Government. Its role is to promote and support research into, and development and exploitation of, technology and innovation for the benefit of UK business, in order to increase economic growth and improve the quality of life. It is sponsored by the Department for Business, Innovation and Skills (BIS).

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### Reference number

16879

### Funding

Total project cost £2.4m

### Technology Strategy Board investment

£1.19m

### Partners

Tetronics Ltd, Imperial College London, in partnership with energy recovery facility operators Veolia and Grundon, environmental consultants Enviro, Hampshire County Council, and industrial symbiosis companies Akristos and Ballast Phoenix

### Project duration

November 2005 – May 2009

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