

## Reduce, reuse, recycle and now retrain

An R&D project has developed a unique method of recovering electronic waste for reuse, together with a brand new e-learning course in how to do it.



### The need

Liquid crystal displays (LCDs) – every home in the UK has at least one, most will have several. They are on laptops, watches, fridges, cookers and televisions. Mass production and retail wars mean more people are able to buy and throw away LCD-based electronic equipment, but the materials used to make them are one of the fastest growing forms of waste in Europe – and among the hardest to dispose of.

LCDs are mainly in products covered by the EU Waste Electric and Electronic Equipment (WEEE) Directive – so there are strict guidelines on their disposal. These guidelines could become even stricter following this year's EU consultation.

Even so, WEEE waste is increasing by up to 28% every five years. As landfill runs out, the need to recycle more of the material is increasing.

### The results

The REFLATED project has developed new ways to disassemble LCDs and separate out the potentially hazardous components into new products. Each component – liquid crystal, indium metal, glass and polarizer plastic – can be reused in innovative applications.

The technology is unique to the UK and has enormous potential for the recycling industry. It is estimated that the recoverable materials have a potential value of \$90m a year, and there has been interest from businesses in America and the Far East.

New market opportunities for liquid crystals include manufacture of low-power displays without backlights, paper-like displays, head-mounted displays, and large flat displays (Frost & Sullivan, 2007). The LCD TV market

alone is expected to grow by 17% by volume during 2009 compared to the previous year (DisplaySearch, 2008).

#### E-learning

Sheffield-based company Active Recycling Ltd has spent nearly a decade developing technology that can recover and recycle the waste materials from electronic gadgets.

From experience, Active Recycling realised that there was very little information to help companies address the principles of the EU's WEEE Directive for the safe disposal of electronic equipment.

Spotting an opportunity, the company put together an e-learning package to enable other organisations and waste management companies to learn the skills needed.

## Competitive advantages

According to Wrap, the UK recycling sector is currently worth £12bn – and set to grow to £20-30bn in the next 15 years. So there is clear potential for both the recovery of valuable LCD components and job creation via implementation of the WEEE Directive.

Modules in Active Recycling's e-learning course in how to use the WEEE Directive and how to disassemble units such as LCDs, have been accredited by the Chartered Institution of Wastes

Management as an industry-recognised standard, and could be worth up to £50m a year to the environmental and educational sectors.

Pilot workshops in three UK prisons have already proved a success in training 300 prisoners, and the e-learning package could be rolled out across many more as part of a programme to re-skill offenders for this new growth industry by the time they are released.

'We've developed a technology that can give something back, not only to the environment but to those who want to learn how to protect it.'

Peter Murphy, Managing Director of Active Recycling Ltd.



### 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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21061

#### Funding

Total project cost £1.74m

#### Technology Strategy

#### Board investment

£880,000

#### Partners

Active Recycling Ltd,  
Active Disassembly Research Ltd,  
Critical Processes Ltd,  
C-Tech Innovation Ltd,  
Engelhard Sales Ltd,  
Glass Technology Services Ltd,  
NIS Ltd, Sims Group UK Ltd,  
University of York

#### Project duration

August 2006 – August 2009

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