





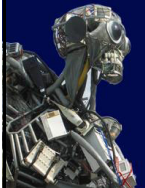

Waste Electrical & Electronic Recycling – UK Experience, an Opportunity for the Indian Market?

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The WEEE Directive

- Aim: Minimise impact of WEEE
- Increase re-use, recycling & refurbishment
- Reduce WEEE going to landfill
- Producer responsibility for financing collection, treatment & recovery of WEEE
- Consumers return WEEE free of charge
- WEEE Directive 2002/96/EC, agreed 13.02.03, EU implementation 13.08.05


Who & What does it apply to?


- Applies to 10 product categories (Large Household Appliances; Small H.A; IT & Telecom; Consumer Equipment, Lighting, E&E Tools; Toys & Leisure equip; Medical, Monitoring & Control & Automatic Dispensers)
- Producers (manufacturers, imports, re-brands)
- Retailers & Distributors
- Public Sector (Municipal Authorities)
- Waste Management Industry
- All UK Businesses & Exporters






Implementation in Europe

- Virtually all EC Countries have, or are close to passing WEEE Directive into force.
- Many countries already had well-established systems for processing WEEE (especially, Germany, Holland, Denmark & Belgium)
- Collection and processing of wastes often assisted by pan-European Compliance Schemes
- Principle of Subsidiarity in Member States







Implementation in UK




- Finally into force 02.01.07
- Consumers not charged, municipal or in-store take back
- New equip' delivery & collection = take-back
- Producers, join Compliance Schemes 15.03.07, compliance by 01.07.07
- Distributors join DTS, or offer in-store take-back
- Historic WEEE taken on like-for-like basis, or paid for by businesses (Pre - 13.08.05)!





The size of UK WEEE Problem

- 2,000,000 tonnes p.a. > Landfill-0.5% UK waste
- Person in EU produces 14Kg WEEE p.a.
- Fastest growing waste stream EU 5-8% @ 3% growth rate = doubling of WEEE by 2020
- Personal Responsibility! RSA WEEE Man

WEEE Experience in India





- Experiencing problem that e-scrap contains hazardous substances but rich in Ag, Au & Cu
- Large recycling industry, major market IT equip
- India = 1 billion pop. Lower users of consumer equip., but in absolute terms, market larger than many EU countries.
- Rapidly Growing Economy, 1998-2002 = 53% increase dom. appliances, PC ownership increased 1993-2000 by 604% (Worldwide Av. 181%), India PC base 4,200,000 (UK 33m users)

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WEEE Experience India





- Environmental concerns amongst consumers and manufacturers not very high, but Indian culture dislikes waste
- New-Dehli based Toxics Link (NGO) est. 1.38 million discarded p.a. (4m in UK) IT equip., takes longer to reach obsolescence, several users of each PC
- Import Regulations prohibit waste import (Min. of Environment & Forests) but no rules on "post-consumer" waste
- WEEE dealt with by scrap metal industry, self-organised and market driven, main incentive financial profit not environmental or societal awareness.

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India – WEEE imports

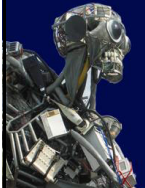




- WEEE is major industry (15,000 Empl. Dehli)
- Estimated that 480,000 tonnes imported p.a.
- Main source USA, although 25,000t from UK
- Following ban on imports of WEEE into China, India and SE Asia now biggest market, with Asian Market 12,000,000t p.a.
- 40% of e-scrap in India from domestic arisings

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UK Processing Market

- WEEE recycling sector started in 2001 with ODS based refrigeration, more categories of waste added in July 2005 with Hazardous Waste Regulations (Gas discharge lamps, CRT's & wet and dry cell batteries).
- Currently about 200-300 companies in WEEE recycling sector, with estimated numbers of processing lines: Refrigeration (13), CRT's (20), IT equip(40); lamps(6); Batteries (1); Mobile phones (2); Smoke alarms (1) & cartridges (1).

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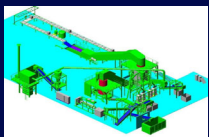
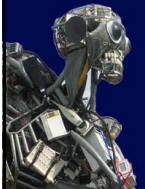
Refrigeration Recycling

- UK 3m CFC units p.a. arising, 35-40% pentane, rest CFC. CFC units have CFC's in compressors and insulation materials
- Three main technologies associated with gas recovery – Carbon Absorption, Cryogenic & Catalytic.
- Main equipment suppliers are German, Italian & Danish, but systems installed in UK provide the best, and most up-to-date technology.

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Refrigeration Recycling




- Carbon absorption technologies were largely used in 1st generation plants
- These have been superseded by cryogenic plants using liquid nitrogen for CFC recovery
- One of the most advanced designs, uses Lesni Catalytic system which destroys CFC molecule
- UK recycling only requires recovery of CFC units, although moves afoot in EU to recover latest refrigerants – e.g. Pentane.

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CRT Processing



- UK processing CRTs for last 18 months, created new recycling industry.
- All technologies represented, including earlier diamond cutting and belt cutting systems & later laser cutting systems
- UK has developed 2 unique, ultra-modern systems which are highly efficient:
 - Revision Glass System
 - Nulife Glass System

CRT – Revision Glass





- Instead of using diamond saw/laser to separate panel & funnel glass, whole CRTs are crushed.
- Proprietary process removes contaminants – Cd, Sr, As & Phosphorus and separates funnel and panel glass cullet
- Cullet re-sold for new CRT manufacture at premium price
- New Plant in 2005, handles 30,000t p.a.







CRT – Nulife Glass

- Few high value uses for the leaded glass
- Panel glass has low residual value
- CRT processing cost high to value of recyclates
- Process optimises recovery of glass, and removes lead as metal
- Improves recycle value

Integrated WEEE Plants



- Several now built in UK to handle not just ODS equipment & CRTs, but all other categories of WEEE
- Usually involve new shredder lines, with hand-picking facilities on front end
- Specialised options for ferrous/non-ferrous metals, separation Cu/Al and/or Stainless Steel
- Plastics recovery, clean up, shredding re-granulation.






Waste Cartridges & Toner Bottles




- New process to take all types of laser, printer, inkjet cartridges & toner bottles
- Processing aimed at wastes which cannot be refilled or re-used for various reasons
- Recovery of metals, shredding then double melt-process incorporates toner powders & inks into plastic, which can then be re-extruded into e-wood
- Denser than mahogany, water proof, termite proof, many hard wearing applications




Opportunities for Indian Mkt



- Established low cost collection network
- Better values for low value recyclates – panel & funnel glass, soda glass (fluorescent lamps), metal quality,
- Mechanical separation Cu/Al/SS & plastics
- Reduces req. for importing virgin plastics
- Legalise WEEE importation issue?
- Satisfy domestic recycling demand
- Safer, healthier environment for ALL.






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Reco-Vie (Recycling) Ltd.



- Processing WEEE since 2000, experienced management team.
- Work as a platform, recycling into 16 processors
- Access to all technologies in UK and EU
- Looking to work with Indian Companies that are keen to develop WEEE recycling facilities in India, and would benefit from our experience & unparalleled access to the market
- Experienced in export markets



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Thank you for Listening!

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