# ewaste

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## ewaste – What is it?

"ewaste is defined as all obsolete or outdated computers, televisions, cell phones, printers, PDAs, and thousands of other electronic devices commonly used in offices, homes and by people on the go."

Source: Electronic Recyclers of America 2006

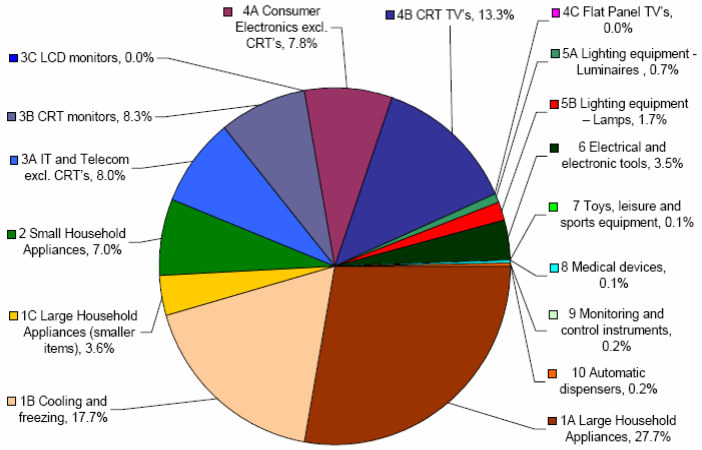


**Figure i: Breakdown of WEEE arising 2005**

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## ewaste – Why is it a Problem?

- ewaste is the fastest growing area in the waste stream (3-5% per annum)
- One US estimate says ewaste accounts for 70% of heavy metals in landfills
- Dumping in undeveloped countries
- The waste problem now is from equipment purchased years ago
- We are buying much more electronic equipment now so tomorrow's problem will be worse

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- e-products are toxic
- Very few of the 1000 toxic substances, other than plastics, are removed before landfilling

| Elements | | | Other | Plastics |
|---|---|---|---|---|
| Arsenic | Cadmium | Mercury | Brominated organics | PVC |
| Antimony | Copper | Phosphor | Phthalate esters | Brominated flame ret. |
| Barium | Hexavalent chromium | Tin | PBDEs | Chlorinated flame ret. |
| Beryllium | Lead | | PCBs | Phosphorous-based flame ret. |



- Toxic substances can be released into the industrial and natural environments at all stages of processing, operation and retirement
- Toxic substances can result in negative impacts on humans and other organisms.

| | |
|---|---|
| Suppression of immune system | Disruption to endocrine systems |
| Carcinogenic | Damage to reproductive systems |
| Cardiovascular disease | Damage to DNA |
| Respiratory tract irritation | Damage to central nervous system |
| Skin infection | Damage to blood system |
| Mortality | Damage to major organs |

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## Waste example on 1100 PCs/CRTs

| | Scrapped/scavenged to Australian landfill (440 PCs) | Exported (264 PCs) | Auctioned/ sold to domestic market (396 PCs) | Total annual waste (1100 PCs) |
|---|---|---|---|---|
| **Lead tonnes** | 0.62 | 0.37 | 0.55 | 1.54 |
| **Cadmium kgs** | 1.2 | 0.7 | 1.1 | 3.0 |
| **chromium grams** | 759 | 456 | 683 | 1899 |
| **Mercury grams** | 253 | 152 | 227 | 631 |



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## … and the rest

- PLUS lesser amounts of nickel, zinc, tantalum, indium, vanadium, terbium, beryllium, gold , europium, titanium, ruthenium, cobalt, palladium, manganese, silver, antinomy, bismuth, selenium, niobium, yttrium, rhodium, platinum, mercury, arsenic, silica and more.
- Nor does it include the fire retardant plastics used which create a different set of disposal problems

**Labourer heating aqua regia -- a mixture of 5% pure nitric acid and 75% pure hydrochloric acid -- a mixture that will dissolve gold.**

Guiyu, China. December 2001.




Guiyu, China. December 2001

A woman about to smash a cathode ray tube from a computer monitor in order to remove the copper laden yoke at the end of the funnel. The glass is laden with lead but the biggest hazard from this is the inhalation of the highly toxic phosphor dust coating inside. Monitor glass is later dumped in irrigation canals and along the river where it leaches lead into the groundwater. 

Women picking through wires torn out of computers. The wires are sorted by day and burned by night in this village.

Guiyu, China. December 2001.
© Basel Action Network



2006 - Boy hired to haul electronic scrap from Alaba market in Lagos, Nigeria to this nearby informal dump sitting on a swamp. Imported scrap televisions and computers that could not be repaired get deposited and burned.
© Basel Action Network 2006



## ewaste – The big bang

- In 2005 approx. 100 million PCs discarded worldwide
- In 2005 approx. 70 million of discarded PCs went to landfill worldwide
- 2007 - 271 million units sold (Gartner)
- 1 billion in use end 2008 – 2 billion in use by 2015 (Forrester)
- Estimated each smart device (eg mobile phone, iPod) has 1 gram of ewaste with an average life of 1 year per device
- 1.1 billion cell phones sold in 2007 (9.28 m in AUS)
- Some US estimates extrapolate there may be up to 10 smart devices per person in the next 5-10 years (phones, iPods, cameras, sensors, GPS, toys etc) & technology keeps changing

## Mobiles

- Hazardeous waste or gold mine
- The drawer
- Low recycling rate
- Travel the world
- Tomorrow's problem



## ewaste – The Australian Problem?

- **Ipsos Household Electrical & Electronic Waste Survey 2005**
  - **Represented 4.2 m households (62%)**
  - **Average household now has 22 items (92m items)**
  - **Includes 11 big ticket items (PCs, TVs DVDs etc)**
  - **Rate of acquisition > rate of disposal**
  - **51% portable equipment goes in the bin (ie in our landfill)**
- **Aust recycling rates low**
- **No regulations**

## ewaste – Why should you care?

- Social Responsibility
- Legislation/Regulations Coming
- In Australia it can cost up to $700 per tonne to recycle but as low as $30 tonne to dump at the landfill site
- Ewaste can be worth something to someone



## What can you do - strategies?

- ***General principles***
  - Waste avoidance
  - Waste re-use
  - Waste recycling
  - Waste disposal
- ***Look at acquisition then disposal***

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## Green Purchasing


- Reuse or avoid buying
- EcoDesign, Energy Efficiency and Packaging
- Disposal/Reprocessing
- Labelling and company credibility (Greenpeace, EPEAT, Blue Angel)
- Life cycle factors



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## eWaste – Company ratings


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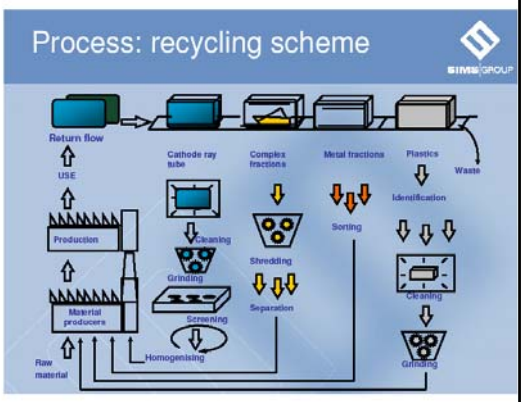
# Recycling & Waste




- Upcycling or downcycling
- "Reprocessors" vs "refurbishers" vs "recyclers"



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# Recycling & Waste

- Know what you have
- Collection processes
- Extend Life/donate
- Disposal processes (QP707 Contract)
- Waste separation

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## Other resources

- www.griffith.edu.au/ewaste
- www.naturaledgeproject.net/
- http://www.greenercomputing.com/current
- http://www.acts.asn.au/
- http://www.epa.gov/epp/pubs/products/epeat.htm

**QUESTIONS?**