

How Public Administration can contribute to a sustainable ICT

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e-work e-government
 e-health
e-elearning e-commerce

ICT

e-democracy e-business
e-inclusion e-procurement

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ICT

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e-waste

PCs environmental footprint

- **High tech complexity** implies that the production of PCs and their components is **energy and material intensive**
- Energy used to operate computers is also relevant
- The disposal (storage, landfill and recycling) of end-of-life-equipment plays an important role in the **direct environmental impact**
- The **hazardous chemicals** in e-waste mean that electronics can **harm workers** in the recycling yards, as well as their neighbouring communities and the **environment**

Stakeholders worried about the environmental issues of ICT

The Australian Computer Society delivered **Australia's first ICT carbon emissions audit**, revealing that ICT used by Australian businesses generated **7.94 million tons(Mt) of carbon dioxide in 2005**, which is **the close equivalent to the civil aviation and the metal production Industries**

ICT usage by Australian businesses represents 2.84% of the emissions attributed to the stationary energy component (energy consumed excluding transportation), and 1.52% of the total national emissions, which totals 522.2 Mt CO₂.

*ICT's carbon emissions are **comparable** in size to other industries such as :*

- **civil aviation** - which is estimated to generate 0.97% of total carbon emissions*
- **metal production** (mostly iron and steel) - which accounts for around 2.3% of total carbon emissions*
- **the cement industry** - at around 1%.*

THE E-WASTE PROBLEM



The amount of **electronic** products **discarded** globally has skyrocketed recently, with **20-50 million tons** generated **every year**.

If such a huge figure is hard to imagine, think of it like this - if the estimated amount of e-waste generated every year would be put into containers on a train it would go once around the world!

The e-waste problem – some figures

- Continued, rapid technological progress in the IT industry has contributed to short lifespans that are well below the functional limits of computers. A short lifespan exacerbates environmental impact, requiring production of more new machines and increasing the numbers heading for landfills or recycling centers
- E-waste is now the fastest growing component of the municipal solid waste stream: mobile phones and computers are causing the biggest problem because they are replaced most often
- In Europe e-waste is increasing at 3%-5% a year, almost **three times faster** than the **total waste stream**

- Developing countries are also expected to triple their e-waste production over the next five years
- The average **lifespan** of computers in developed countries has dropped from **six years** in 1997 to just two years in 2005
- 183 million computers were sold worldwide in 2004 -**11.6 % more** than in 2003
- By 2010, there will be 716 million new computers in use. There will be 178 million new computer users in China, 80 million new users in India

Toxic Tech: Not in Our Backyard

Uncovering the Hidden Flows of e-Waste



FULL REPORT
FEBRUARY 2008

greenpeace.org

GREENPEACE

Creating a Toxic-Free Future

Reduce, Reuse, Recycle

- **Reduce**
- The term **reuse** means the equipment is still working and the “life” of the product can continue
- The term **recycling** means the equipment is *disassembled* and the components - such as plastic, glass and metals - are recovered and used to manufacture new products (raw materials)

Computer recycling issues

- The *environmental burden* associated with producing a PC comes from the making of the high-tech parts
- The internal structure of a PC is complex, making *proper* recycling time consuming and expensive
- The *environmental payback* from material recycling is comparatively less than that of appliances, like refrigerators
- PC *proper* recycling is low profitable

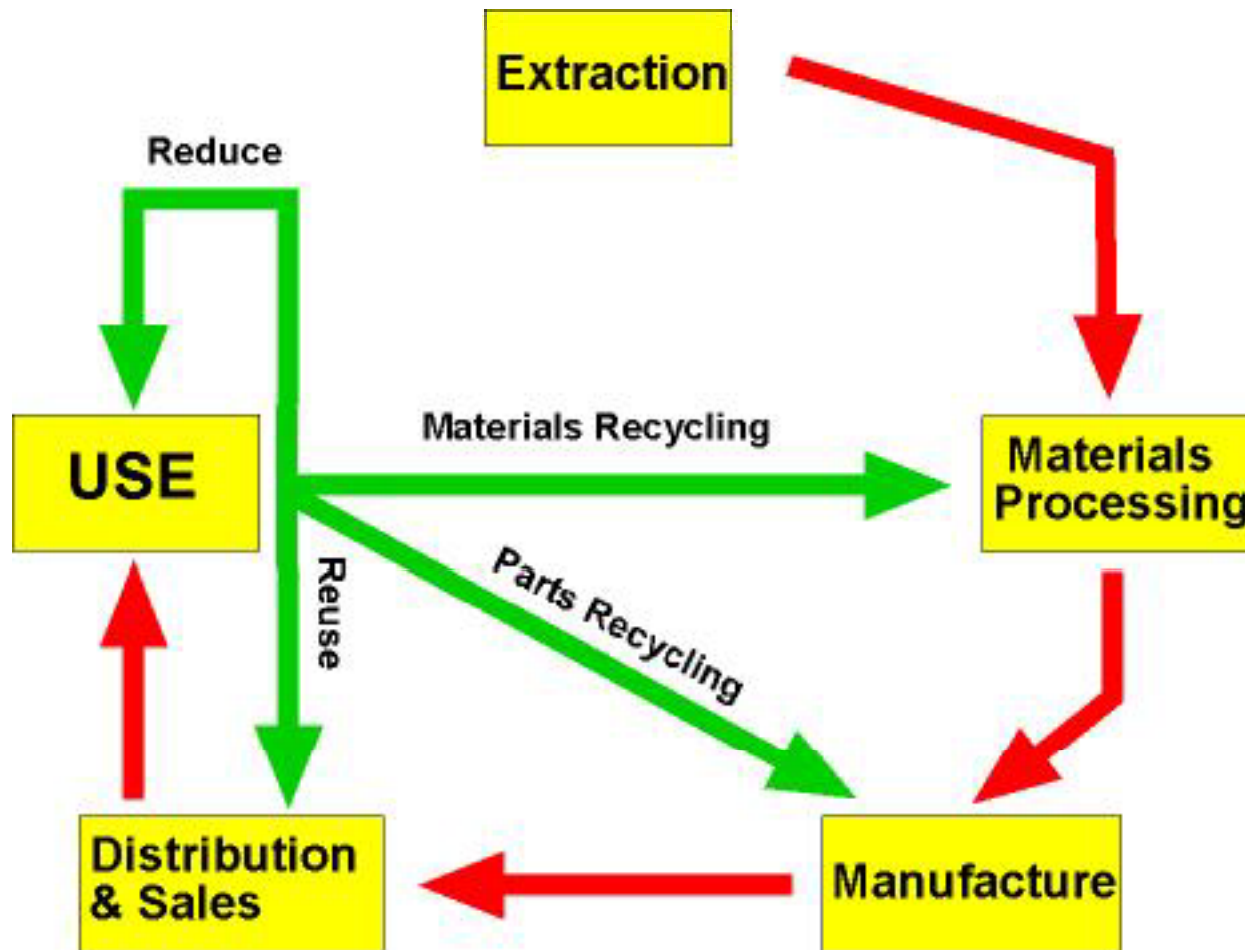
Reuse vs recycle

- Many of the machines are either still usable creating a real challenge for end-of-life processing
- When a computer no longer satisfies the needs of its user, she or he can sell or donate it to another user who has lower demands on performance
- While collection systems and recycling technologies are clearly needed, the common wisdom of waste management is that, **reducing and reusing** are often very **effective** and economical approaches **compared to recycling**

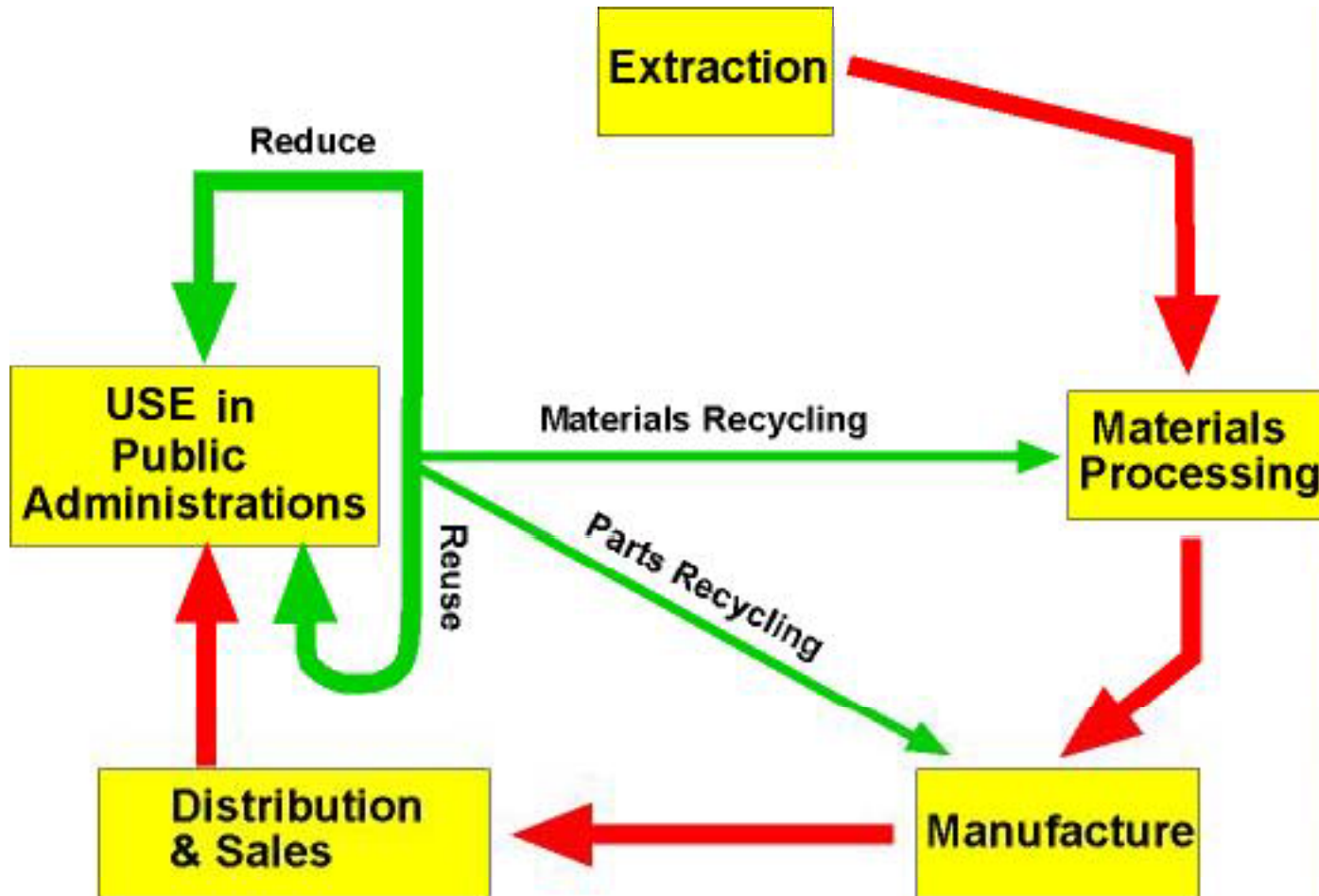
Extending the lifespan of a computer through reuse can be a useful strategy

- The effects of RoHS (Reduction of Hazardous Substances) EU Directive will be seen in the future
- First generation of Green computers
- Most PCs in use are not green at all!
- Technology for recycling is improving - *Best Available Technologies*

Reuse in the private sector



Reuse in the public sector



Reuse in the Public Sector

The mantra of "**Reduce, Reuse, Recycle**"
(3Rs)

here becomes

"Reduce, Reuse, Recycle, Rethink" (4Rs)

Reuse of Obsolete PCs – an example

The potential E-WASTE stock
Genoa Novembre 2006



Thin client computers
**Osservatorio Tecnologico
laboratories - Genoa, march 2007**



Another example

- A national agreement between the Ministries of Transport and Education gave Italian schools a few thousand old PCs, managed on a regional basis
- GROSS (Genoa Reuse with Open Source at School): a pilot project to create a general framework for reuse computers at school
- Genoa PCs stock: ~200 Pcs

GROSS - project

- A technical software solution suitable for the schools:
old PCs are used as **Thin clients**
- A Guideline for donation to schools with procedural and practical suggestions for donors and criteria to evaluate the feasibility and sustainability of a donation program

Example of criteria: *a large number of obsolete but homogeneous PCs allows easy replication*

Strengths

- No client administration/management
- Only terminal server administration/management
- Zero software licence costs
- Scalability
- Full reuse of potential e-waste

Weaknesses

- Know how: professional skills for feasibility study, cost/benefit analysis and prototyping
- Man/Months of work
- Data clean-up
- (Physical) storage
- Transportation of old equipment

Responsibility across the whole life cycle of computers

DESIGN

- Increase power efficiency
- Improve power handling
- Design for the environment

MANUFACTURE

- Cleaner manufacturing processes
- Apply CSR to suppliers
- Reduce use of hazardous substances
- Minimize transport & packaging impact

OPERATION

- Manage IT energy usage in the data centers and beyond
- Implementing green source criteria
- Thin computing
- Server Virtualization

DISPOSAL

- Reuse and refurbish systems
- Recycle systems at end-of-life
- Recycle consumable

Buy, Use and Dispose

What

**“responsibility for the whole life
cycle of computers”**

means for PAs

Buy

Green Public Procurement

- Green architecture : server virtualisation, GRID...
- Thin computing
- **Ecodesign** - takes into consideration the whole life cycle:
 - Elimination of hazardous substances
 - Reduction of energy consumption
 - Aid to the dismantling processes by identifying (RFID) the hazardous components or those suitable to be recycled

Use – key recommendations

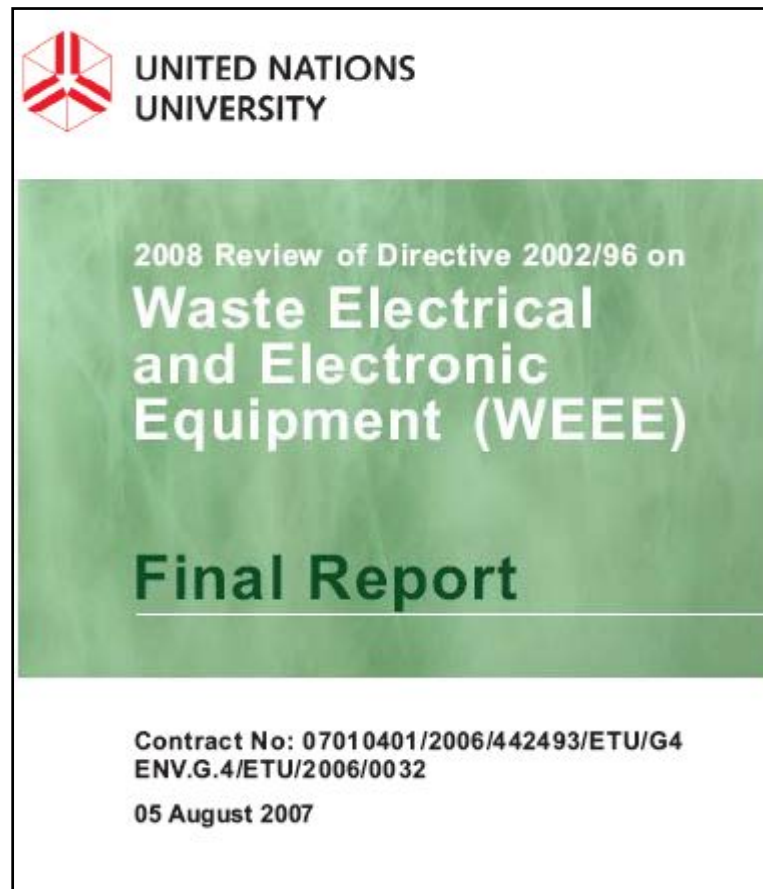
| Back Office | Green Desktop | Green Office |
|--|--|--|
| <ul style="list-style-type: none">•Data center audits•Energy monitoring•Server Virtualization•Power and cooling | <ul style="list-style-type: none">•Paperless office•Power management (disable screen savers and implements sleep mode for period of inactivity)•Thin client computing (desktop virtualisation)•Video conferencing | <ul style="list-style-type: none">•Green energy•Intelligent building•Home working policy |

Disposal

- *If new computers are acquired, Public Administrations should take into account the option of donating it for reuse when they will need to be upgraded or changed*
- *The Public administration have to simplify the donation procedures*
- *The procedures have to take into consideration the data cleanup*

- *It can be useful to have work teams composed by donors and receiving subjects (i.e. schools)*
- *It's important to **donate** end-of-life computers immediately instead of keeping them in storage for months or years*

Sharpen the definition of reuse





E-waste art

Thanks for your attention!