

# Reuse of Personal Computer Equipment

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# Overview

1. Transformation of Personal Computers
2. Refurbishment
3. US Jobs
4. “Green” (Environmentally Better)
5. Cost effective
6. Strategic
7. Reuse is Reliable
8. Barriers

# Transformation

- New Operating Systems (simple but not easy)
  - Windows 7
    - “Blind” test of college students – 36% could not correctly identify a P III (800 MHz) vs. P4 (2.4 GHz) using Internet Explorer\
  - Google Chrome (anticipated)
  - Linux – non issue
    - High level of technical expertise
    - Small user base
    - Small number of drivers

# Transformation continued

- Top 4 applications
  - E-mail (75%)
  - Word processing (68%)
  - Spreadsheets (64%)
  - Scheduling (57%)
    - (Bureau of Labor Statistics, 2003)
- Don't require today's hardware
  - e.g. iPad, A4 processor comparable to P III?
- It's not the hardware but the software!

# Refurbishment

- Computer refurbishment defined as only software replacement
- Specialized skill
  - Drivers (100 gigabytes and counting)
- Special opportunity
  - Redistribution of models
  - Homogenize models (goal)
- New tools recently available
  - RPK – Refurbisher’s Preinstall Kit

# US Jobs

- 100% of computer refurbishment jobs are local
- Entry level jobs
  - Kinetic skills
  - On the job training
  - Higher end technology skills leveraged
- \$50,000 economic impact per job
- New equipment
  - 20% of funds are US jobs!
  - Considerably more expensive – (3 to 5 times more costly)

# Environmentally Better

- Reuse of 2 PCs, climate equivalent of 1 car.
  - 80% of embodied energy is in the manufacturing
  - Average hard drive at 6 years = 20,000 hours of use
    - 40% of design life, 50,000 hours (max 90,000 hrs)
    - ~9,000 hours in a year (24 x 365)
    - Suggests 15 years of use quite possible
  - Average hard drive at 6 years = 30% of space used
    - IT shouldn't want large hard drives around
      - Millions of drives with a terabyte of data = IT nightmare!
    - 1.2 Zettabytes (sextillion) of data worldwide ( $1.2 \times 10^{21}$ )

# Cost Efficient

- Refurbishment \$165 vs. new ~\$600+ (Hardware)
- Doable on site
  - Microsoft Refurbisher Preinstall Kit (RPK)
  - Demo
- Scalable
  - Network distribution
- Avoid “refresh” costs and logistics
- Simplified support

# Strategic

- PC are essential to our nations security and economy
- Current manufacturing is primarily offshore
  - Puts economy at risk
  - Puts security at risk
- Strategic materials are almost exclusively mined offshore
  - Rare Earth elements – China
  - Critical elements – 13 year supply of Indium (think flat pannels)
  - Conflict minerals

# Reuse is Reliable

- Hardware failures – infrequent
  - First year of refurbished = 10% less than new
  - (see also hard drive data)
- Software failures – very frequent
  - Viruses/malware
  - Software overload
  - Denial of service
- Easily fixed – refurbish/restore

# Barriers

- Marketing of the latest and greatest
- Momentum – “I needed one three years ago”
- EPEAT – FAR
  - EO 13423
    - 95% Bronze
    - EPEAT is only for new products even though the environmental benefits of reuse “swamp the EPEAT standard” (Wayne Reifer)
- NOT OEMs - ITI supports appropriate refurbishment and reuse of electronic devices to drive sound environmental outcomes and increase access to technology.

# Hypothetical

- For every 10,000 refurbished PCs that the US government purchases (1%<sup>1</sup>) . . .
  - 330 direct new US Jobs
    - indirect jobs?
    - induced jobs?
  - Emissions reduction equivalent to 15,000 cars
    - 3 years of reuse
  - Federal budget savings of \$4,350,000

<sup>1</sup> 2.8 Million Federal Employees - Civilian, I assume 1,000,000 PC bought per year

# Next Steps

- EO explicitly supporting refurbishment
  - EO 12999 (April 1996) rework/adjust
  - EO 13423 (January 2007) rework/adjust
- Pilot project? (leadership)
  - Census would have been good demonstration
    - Short term
    - Low demand (top 4 activities)
    - Cost effective
    - US jobs
    - Volume

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