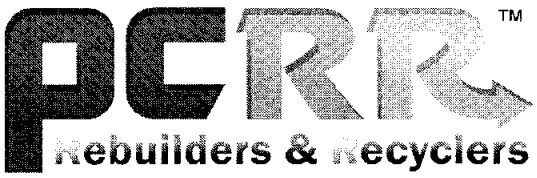

Written Testimony for

Willie Cade from PC Rebuilders & Recyclers, LLC (PCRR)

Tuesday May 15th 2012

Before the United States International Trade Commission

Investigation Number 332-528

Used Electronic Products:
An Examination of U. S. Exports

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Executive Summary

The BBC World Service recently released a global poll of more than 27,000 people that found four in five adults (79%) regarded internet access as their "fundamental right[1]." If we believe estimates that 1 billion people on our planet currently use a Personal Computer (PC) and all but 1.3 billion have no access to electricity[2] we can conclude that 3.4 Billion (80% of the remaining 4.3 Billion) people "want" access to the Internet. Used electronics can be one of the most economical and environmentally sound ways to satisfy this desire. Adopting PC-users as a proxy for ownership of Personal Computers (PCs) the United States with 3 times as many PC-users[3] than the second place country, Japan, combined with the rapid turnover of PCs in the U.S. is a good source of used PCs.

Additionally PCs in the United States are underutilized and well made. Figure 1 on the following page shows a graph of the count of hours PC's hard drives are used. Note that 25% of the PCs are used less than 500 hours when they are categorized as "End of Use." PCs made for the United States market are known to have significantly higher quality than other markets. This is due principally to the preference given by US buyers to high quality brands such as Dell.

While there has been much press attention to the problem of export of used electronics from the US and other developed countries this author believes that much progress has been made recently to assure that this equipment is sent for reuse and/or material recovery within formal operations both within and outside the U.S. These formal operations are far more likely to responsibly process these materials notwithstanding the state of the country's economy. One of a number of factors that has lead me to this conclusion is that there are 202 facilities that are certified to the new R2 or Responsible Recycler Standard[4]as of this writing. Most of the negative press reports have come from the informal processing of "End of Life" electronics also known as "back yard recyclers."

[1] BBC News, "Four in Five Regard Internet Access as a Fundamental Right: Global Poll," BBC, http://news.bbc.co.uk/2/shared/bsp/hi/pdfs/08_03_10_BBC_internet_poll.pdf

[2] WEO -2011 report by the IEA (International Energy Agency) http://www.worldenergyoutlook.org/financing_access.asp

[3] Top ten Countries with the Most PC-Users (2011) http://www.mapsofworld.com/world-top-ten/world-top-ten-personal-computers-users-map.html#

[4] Electronic Recyclers with R2 Certified Facilities listed on the R2 Solutions web site http://www.r2solutions.org/certified/electronic-recyclers-with-r2-certified-facilities/

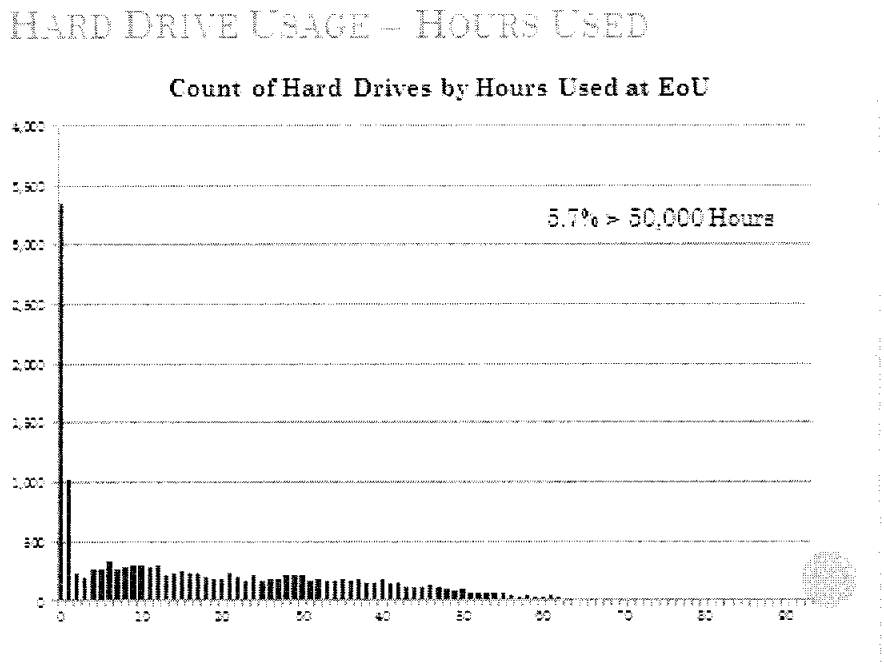

Figure 1: Thousands of hours of hard drive use. Sample size over 15,000 drives
Source: PCRR's Digital Data Destruction reporting using VAIRIFi.

Dramatic increases of year over year growth of the number of PC that are refurbished with legal licenses are contributing to robust and profitable industry primarily in the U.S. Recent examination of online sales for a single PC model (772 units) within the last 90 days demonstrates that PCs refurbished with an O/S sold for an additional $90.51. Another important advantage to PCs refurbished with genuine licensing is the ability for that system to access ongoing security updates. Because PCs are exposed to a large volume of malicious software and programing errors (a.k.a. bugs) they require regular updating of all of their software. This author asserts that much of the decrease performance experienced by PC users just a few years after the original purchase is due to a poorly maintained collection of software. The hardware continues to function properly.

While PCRR actively supports certification to a "Voluntary Consensus Standard[5]" such as R2 we recommend in the near term that the US government require third party observation for the loading of containers with used electronic goods. Many firms already exist that have been approved by destination countries for this purpose. Long term we recommend the creation of Harmonized Tariff Codes for reusable electronics.

[5] Defined in the Office of Management and Budget Circular No. A-119.
http://www.whitehouse.gov/omb/circulars_a119

Introduction

William (Willie) Cade is the Co-Chair of Project Group 1.1 on Environmentally Sound Testing, Refurbishment & Repair of Used Computing Equipment of the Partnership for Action on Computing Equipment (PACE) of the Basel Convention of the United Nations Environmental Program. We have prepared a 69 page document[6] (see Appendix I) that guides refurbishers on how to implement environmentally sound practices. The document is currently being field tested. PACE has created other useful documents such as a Glossary of Terms and a Guideline on Environmentally Sound Material Recovery and Recycling of End-of-Life Computing Equipment[7].

Mr. Cade enjoys an appointment as Adjunct Faculty at the University of Illinois Urbana/Champaign in the Department of Art and Design. He teaches an online course entitled Sustainable Life Cycle Design to graduate students and upper classmen. The course focuses on used electronic products to investigate industrial design concepts that promote sustainability.

During the development of the Responsible Recycler (R2) standard Willie participated as a stakeholder representing reuse. The R2 standard highly prioritizes reuse as responsible use of used electronic products.

Mr. Cade founded PC Rebuilders & Recyclers, LLC. (PCRR) in 2000. PCRR is one of 18 Microsoft Authorized Refurbishers in the United States. PCRR has completed a rigorous third party audit of its business practices and is certified to the R2 standard. PCRR is also an exporter of refurbishable and refurbished PCs.

PCRR is the only worldwide distributor of Microsoft's Refurbisher Pre-Install Kit (RPK) software written by Microsoft engineers to automate the refurbishment process. We also organize the annual International Computer Refurbisher Summit (ICRS) in the U.S. This year we will be hosting 5 regional ICRS events in Prague, the Czech Republic; Accra, Ghana; Bogota, Colombia; Sydney, Australia; and Singapore[8]

[6] GUIDELINE ON ENVIRONMENTALLY SOUND TESTING, REFURBISHMENT & REPAIR OF USED COMPUTING EQUIPMENT
http://archive.basel.int/industry/compartnership/docdevpart/ppg11DraftGuidelineFinal-2011-03-15.pdf

[7] Partnership of Action on Computer Equipment
http://archive.basel.int/industry/compartnership/index.html

[8] Regional International Computer Refurbishing Summits Hosted by PCRR
http://www.pcrr.com/crs/

Worldwide Demand

The BBC World Service recently released a global poll of more than 27,000 people that found four in five adults (79%) regarded internet access as their "fundamental right[1]." If we believe estimates that 1 billion people on our planet currently use a Personal Computer (PC) and all but 1.3 billion have no access to electricity[2] we can conclude that 3.4 Billion (80% of the remaining 4.3 Billion) people "want" access to the Internet. Used electronics can be one of the most economical and environmentally sound ways to satisfy this desire. Adopting PC-users as a proxy for ownership of Personal Computers (PCs) the United States with 3 times as many PC-users[3] than the second place country, Japan, combined with the rapid turnover of PCs in the U.S. is a good source of used PCs.

Of course PCs are not the only used electronic devices with significant economic value if properly managed; cell phones, photocopiers and many others are responsibly shipped overseas after the end of their first use. Under certain circumstances equipment leasing is advantageous and widely utilized by businesses in the U.S. This popular ownership structure lends itself to large-scale operation for take back and refurbishment of equipment at the end of first use. This large-scale promotes profitability and responsible management of potential waste.

PCRR's experience shows an increase of one Full-Time Equivalent (FTE) for every 40 foot container of refurbisherable[9] and two FTEs for every 40 foot container of refurbished[9] PCs. PCRR has shipped over 10 containers in the past three years. While this is a relatively small number, we anticipate significant future growth.

PCRR's most recent shipments have been to Angola. Because of past events in Angola with internal conflicts, we were required to hire COTECNA to do a physical inspection of our container packing process from start (a completely empty container) to finish (the final seal installed on the container). COTECNA is the firm that has been approved by the government of Angola for these inspections. Without this report, see Appendix II, our shipper would not have boarded our container. It is this author's opinion that a physical inspection by a qualified third-party can be a cost-effective method for assuring the export of refurbishable and refurbished used electronics. In many cases, this methodology would be less expensive than obtaining facility certification and more reliable.

[9] PACE Glossary of Terms, Page 4:
http://archive.basel.int/industry/compartnership/docdevpart/PACEGlossaryTermsFinal-2011-03-15.pdf

Used Electronics are a Complex Product

Today's electronics use a very wide variety of materials. Recently there has been a lot of activity in the press about so-called "Rare Earth Metals" that are used in the manufacture of electronics. A few countries dominate the supplies of these elements and concerns abound that these countries will artificially inflate the prices or limit access of these materials. Additionally in 2010, Congress passed and President Barack Obama signed the Dodd-Frank Wall Street Reform and Consumer Protection Act, which required the Securities and Exchange Commission to draft regulations implementing the Conflict Mineral Law. These facts combined with a worldwide manufacturing system for electronics detail a large and complicated production process. The products themselves are also complex.

Along with this physical complexity, almost all of today's **electronic devices are software dependent**. In other words, without software, these devices do not work. Also, it is important to understand that defective (commonly referred to as buggy) software, in this author's opinion represents the majority of computer problems. Most operating systems in use today have more than 45 million lines of code[10]. Given the large numbers of lines of code and the degree of complexity, it is essential that operating systems and other software packages routinely be updated or corrected. Relative to the physical device software should be considered fragile. Advanced information technology (IT) managers update and reinstall (refurbish) their computers on a regular basis, as frequently as every two years. Additionally, most software is licensed for its original user and practically speaking is not transferable.

Normal usage of today's electronic devices requires significant storage and use of personal and confidential information. Therefore, at the end of use, detailed procedures are required to effectively destroy the data. The National Institute of Standards and Technology, Special Publication 800 – 88: Guidelines for Media Sanitization[11] is the most up-to-date media sanitization guide. Even this document is dated, given the rapid developments in the electronics industry. Specifically, Special Publication 800 – 88 inaccurately suggests that flash memory or Solid-State Drives (SSD) can be overridden successfully. Due to technical reasons associated with the memory management of SSD's assured data erasure procedures have yet to be fully developed.

Fortunately, the Windows 7 Operating System reliably functions on hardware manufactured over eight years ago. This allows refurbishers to deliver cutting edge software on older hardware. Today's hottest products use less computing power than PCs built 10 years ago.

[10] "How Many Lines of Code in Windows XP?". Microsoft. January 11, 2011.

[11] NIST Special Publication 800-88; http://csrc.nist.gov/publications/nistpubs/800-88/NISTSP800-88_rev1.pdf

Significant Changes in the Used Electronics Industry

Since 2000, Microsoft has demonstrated leadership with its Microsoft Authorized Refurbisher (MAR) program and its Microsoft Registered Refurbisher Program (RRP) for refurbishing PCs. Today, there are nearly 4000 MARs or RRP's worldwide. Both of these programs allow refurbishers access to genuine Microsoft licenses. Recently, these programs have shown significant growth. Also, PCRR is budgeting 100% growth for 2012.

During the first 16 months of certification to the Responsible Recycling (R2) standard (see Appendix III) there has been over 200 facilities certified. R2, a voluntary consensus standard[5] has clarified the procedures necessary for organizations to deal with end-of-life electronic equipment. There are 13 basic practices outlined in R2, which includes such topics as data destruction, legal requirements, facility security, transportation and recordkeeping. While this certification is not inexpensive ($20,000 for PCRR) and there are considerable recordkeeping requirements, we see value and improvement in our operations.

This author believes that non-consensus standards offer to great a possibility for conflict of interest between the certified facility and the developer of the standard.

Research on Used Electronic Devices

A significant part of Mr. Cade's role as adjunct faculty at the University of Illinois Urbana/Champaign is to conduct research about used electronic devices. One interesting fact that has come to light is the high number of systems with relatively low usage during their first use. Figure 1 below shows a graph of the count of hours PC's hard drives are used. Note that 25% of the PCs are used less than 500 hours when they are categorized as "End of Use." PCs made for the United States market are known to have significantly higher quality than other markets. This is due principally to the preference given by US buyers to high quality brands such as Dell.

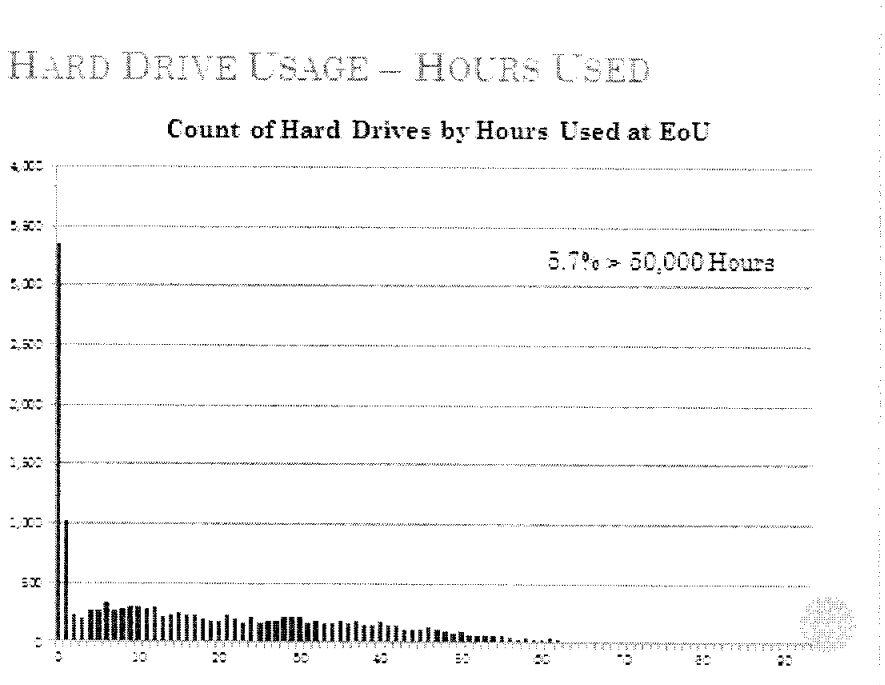

Figure 1: Thousands of hours of hard drive use. Sample size over 15,000 drives
Source: PCRR's Digital Data Destruction reporting using VAIRIFi.

Other areas of research focused on reuse include hard drive space utilization, which averages 27.7% of the available storage; hard drive longevity, predicted at 160,000 hours; laptop battery utilization, reported at 2% of usage. Also significant interest is the age of equipment at end of use, distance people travel to properly dispose of their equipment, etc. There is also a significant amount of research needed on material recovery from End-of-Life electronics.

Recommendations

1) The US government should require a third party observer for the loading of containers with used electronic goods. Many firms already exist that have been approved by destination countries for this purpose. This procedure has already been incorporated into the international shipping protocol. In addition, there will be a high degree of certainty that proper materials were packed and shipped overseas, see Appendix II for an example.

2) Long term we recommend the creation of Harmonized Tariff Codes for reusable electronics.