Electronics TakeBack Coalition

TAKE IT BACK. MAKE IT GREEN. RECYCLE RESPONSIBLY.

Facts and Figures on E Waste and Recycling

This is a summary of available statistics that quantify the problems of electronic waste and e-waste recycling efforts. Each item includes its source and link to the original documents (where available), to make it easy for reporters to confirm data back to the original source.

We assembled these statistics primarily for media and for legislators and advocates of e-waste policies. This list will be updated periodically as new statistics are released.

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Updated: September 21, 2009

How Much E-waste is Being Discarded?

Whether trashed or recycled, what are we getting rid of each year in the US? (See next section for what we stockpile.)

E-Waste in 2007 – Was it Trashed or Recycled

Products	Total disposed** (million of units)	Trashed (million of units)	Recycled (million of units)	Recycling Rate (by weight)
Televisions	26.9	20.6	6.3	18%
Computer Products*	205.5	157.3	48.2	18%
Cell Phones	140.3	126.3	14	10%

*Computer products include CPUs, monitors, notebooks, keyboards, mice, and "hard copy peripherals", which are printers, copiers, multi's and faxes.
**These totals don't include products that are no longer used, but stored.

Source: EPA [1]

41.1 million desktops & laptops

The EPA (in report summarized above) estimates that 29.9 million desktops and 12 million laptops were discarded in 2007. That's over 112,000 computers discarded per day!

31.9 million computer monitors

The EPA report (above) estimates that 31.9 computer monitors were discarded in 2007 – both flat panel and CRTs.

400 million units of e-waste

In a 2006 report, the International Association of Electronics Recyclers projects that with the current growth and obsolescence rates of the various categories of consumer electronics, (a broader list than the EPA used above, including DVDs, VCRs, mainframes) somewhere in the neighborhood of 3 billion units will be scrapped during the rest of this decade, or an average of about **400 million units a year.**[2]

Over 3 million tons of e-waste disposed in 2007 in USA

In 2007, we generated **3.01 million tons of e-waste in the US**. Of this amount, only 410,000 tons or 13.6% was recycled, according to the EPA. The rest was trashed – in landfills or incinerators.

Selected consumer electronics include products such as TVs, VCRs, DVD players, video cameras, stereo systems, telephones, and computer equipment."[3]
Note: EPA's 2008 data is expected in November or December 2009.

[1] "Electronic Waste Management in the United States, Approach 1" Table 3.1 EPA530-R-08-009 US Environmental Protection Agency, July 2008. http://www.epa.gov/osw/conserve/materials/ecycling/docs/app-1.pdf
[2] International Association of Electronics Recyclers Industry Report, 2006. Available at http://www.iaer.org/communications/indreport.htm
[3] "Municipal Solid Waste Generation, Recycling, and Disposal in the United States: Facts and Figures for 2007." United States Environmental Protection Agency, Office of Solid Waste (5306P) EPA530-R-08-010, November 2008. Data is from Characterization Data Tables 12 – 14, beginning on page 71. Report: http://www.epa.gov/osw/nonhaz/municipal/pubs/msw07-rpt.pdf

20 to 50 million metric tons of e-waste disposed worldwide each year	"Some **20 to 50 million metric tonnes** of e-waste are generated worldwide every year, comprising more than 5% of all municipal solid waste. When the millions of computers purchased around the world every year (183 million in 2004) become obsolete they leave behind lead, cadmium, mercury and other hazardous wastes. In the US alone, some 14 to 20 million PCs are thrown out every year. In the EU the volume of e-waste is expected to increase by 3 to 5 per cent a year. Developing countries are expected to triple their output of e-waste by 2010." [4]
E-waste is still the fastest growing municipal waste stream in the US	The category of "selected consumer electronic products" grew by almost 6% from 2006 to 2007, from 2.84 million tons to 3.01 million tons.[5] While it's not a large part of the waste stream, e-waste shows a **higher growth rate than any other category** of municipal waste in the EPA's report. Overall, between 2005 and 2006, total volumes of municipal waste increased by only 1.2%, compared to 8.6% for e-waste.
Only 13.6% of disposed e-waste is recycled	Only 13.6% of the consumer electronic products generated into the municipal waste stream (meaning, that people tossed out) were "recovered" for recycling in 2007. This compares to the overall recovery rate of all categories of municipal waste was 33.4% in 2007. A total of 41,000 tons of electronics were recovered in 2007.[6]

How Much Electronic Waste Gets Stored or Stockpiled?

68% of consumers stockpile	**"68 percent** of consumers stockpile used or unwanted computer equipment in their homes."[7]
235 million units in storage as of 2007, including **99 million TVs**	The EPA estimates the following quantities of electronics were in storage by 2007 (not including cell phones) Televisions: 99.1 million Desktop computers: 65.7 million Desktop monitors: 42.4 million Notebook computers: 2.1 million Hard copy peripherals: 25.2 million (printers, copiers, faxes, multi's) **TOTAL: 234.6 million units in storage**[8]

[4] Press Release, "Basel Conference Addresses Electronic Wastes Challenge." November 27, 2006, United Nations Environment Programme (UNEP). Available at: http://www.unep.org/Documents.Multilingual/Default.asp?DocumentID=485&ArticleID=5431&l=en

[5] ""Municipal Solid Waste Generation, Recycling, and Disposal in the United States: Facts and Figures for 2007." United States Environmental Protection Agency, Office of Solid Waste (5306P) EPA530-R-08-010, November 2008. Data is from Characterization Data Tables 12 – 14, beginning on page 71. Report: http://www.epa.gov/osw/nonhaz/municipal/pubs/msw07-rpt.pdf

[6] Ibid. Table 13 page 72. Note: See page 34 of report for definitions of generation and recovery.

[7] HP Fact Sheet, Earth Day 2005. http://www.hp.com/hpinfo/newsroom/press_kits/environment/earthday-fs.pdf

[8] "Electronic Waste Management in the United States, Approach 1" Table 3.1 EPA530-R-08-009 US Environmental Protection Agency, July 2008, Table 3.4 on page 25. http://www.epa.gov/osw/conserve/materials/ecycling/docs/app-1.pdf

Sales in Electronics - How Much Electronics Are Being Sold

Note: Many statistics on sales are expressed in terms of "units shipped" from the manufacturers into their various sales channels.

Consumer Electronics

500 million units in 2008 in US

According to the Consumer Electronics Association (CEA), consumers were expected to purchase **500 million units** of consumer electronics in the US in 2008. US households spend about **$1407 per year** on hardware.[9]

$172 billion in consumer electronics products sold in 2008.
$171 billion projected for 2009

According to the Consumer Electronics Association, US consumers purchased $172 billion in consumer electronics in 2008, up 5% from 2007 sales, despite the economic downturn. Sales are expected to remain at almost that level in 2009, at $171 billion. 15% of that revenue will be from television sales.[10] [See TV sales numbers below.]

Computer Sales

295 million computers were sold in 2008 worldwide. The US bought over 68 million of them.

According to IDC's Worldwide Quarterly PC Tracker, **manufacturers shipped 295.2 million computers worldwide in 2008**, up from 235 million in 2006, up 14.3%. They sold 68 million of these in the US.[11]

PCs include Desktops, Notebooks, Ultra Portables, and x86 Servers and do not include handhelds

Computer sales projections:
282 million worldwide in 2009
426 million worldwide by 2012

Industry analysts predict that in 2009, 282 million computers will be sold worldwide, with 62.3 million of those in the US. These numbers are down from 2008 because of the economy, but IDC predicts the industry will rebound in 2010, selling more than 300 million computers worldwide. These numbers will increase to 419.4 million sold worldwide in 2013, with 70 million of those sold in the US in 2013.[12]

PCs include Desktops, Notebooks, Ultra Portables, and x86 Servers and do not include handhelds

Television Sales

2.9 Million HD TVs bought for Super Bowl 2009.
3.9 MILLION total TVs bought for Super Bowl 2008 (HD and non-HD)

The Consumer Electronics Association estimates that US consumers bought 2.9 million HD TVs for Super Bowl 2009. (They did not release a figure for TOTAL TVs sold.)[13]
Americans were expected to buy 3.9 million TVs for the 2008 Super Bowl, according to the National Retail Federation.[14] That's up more than 50% from the 2.5 million we bought for the 2007.

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[9] Consumer Electronics Association, Presentation by Parker Brugge to E-Scrap Conference, Sept 17, 2008.
[10] Consumer electronics Association Press Release, January 1, 2009.
http://www.ce.org/Press/CurrentNews/press_release_detail.asp?id=11666
[11] IDC Press Release, "PC Shipments To Drop 4.5% in 2009, According to IDC," March 5 2009**,** IDC Worldwide Quarterly PC Tracker. Available at http://www.idc.com/getdoc.jsp?containerId=prUS21725509
[12] IBID
[13] Press Release from Consumer Electronics Association, Jan 30, 2009.
http://www.ce.org/Press/CurrentNews/press_release_detail.asp?id=11679
[14] Press Release from National Retail Federation: "As Super Bowl Sales Near $10 Billion, Retailers Plan Big Promotions, According to RAMA," January 213, 2008. Available at: http://www.nrf.com/modules.php?name=News&op=viewlive&sp_id=461

	superbowl. We bought 1.7 in 2006.
34.5 million digital TVs in 2009 26.8 million digital TVs in 2008	The Consumer Electronics Association (CEA) predicts that in 2009, we will buy 34.5 million digital TVs in the US, up from 26.8 sold in 2008. They predict that 29.8 million of these will be HD TVs.[15]
Manufacturers earned over $25 BILLION selling digital TVs in 2007.	"According to new CEA sales projections, manufacturers will post 11 percent revenue growth, to over $25 billion, from sales of digital televisions in 2007. CEA also forecasts 13 percent revenue and 17 percent unit sales growth for digital television in 2008."[16]
138 million TVs sold worldwide	Market research firm iSupply predicts that TV makers will sell 138.97 million digital TVs worldwide in 2008, up from 117.7 in 2007. They predict the number will grow to 252.7 million DTVs sold by 2012.[17]
North America accounts for 83% of the 50"+ TV market	**We are buying BIG TVs**. While the average TV size in North America is 29.5 inches, North America accounted for 83% of the 50"+ market and 52% of the 40"+ market[18]

Cell Phone Sales

1.18 billion cell phones sold worldwide in 2008	According to IDC's Worldwide Quarterly Mobile Phone Tracker, vendors shipped a total of 1.18 billion units in 2008, up 3.5% over the 1.14 billion units shipped during 2007.[19]
4 BILLION cell phone users worldwide	"By the end of 2008, an important milestone in the ICT [information and communications technologies] development race was achieved: over 4 billion mobile cellular subscriptions worldwide…" [20]

Digital TV Conversion Statistics

Are we experiencing an E-Waste Tsunami?

We believe a large numbers of TVs are being disposed of in conjunction with the digital conversion (now and in the future). Consumers have a lot of TVs in storage (not used, ready for disposal). Now that we

[15] Press Release from Consumer Electronics Association, Jan 30, 2009. http://www.ce.org/Press/CurrentNews/press_release_detail.asp?id=11679
[16] IBID
[17] "DTV Market Booming, Despite or Because of Ecomony: iSupply," *This Week in Consumer Electonics*, citing research from iSupply. September 4, 2008. http://www.twice.com/article/CA6592913.html?industryid=23106
[18] DisplaySearch press release, November 27, 2006; **"**DisplaySearch Report Indicates Samsung Takes the Top Position in Global TV Units and Revenues," http://www.displaysearch.com/press/?id=1014
[19] IDC Press Release, "Worldwide Mobile Phone Market Declines by 12.6% in Fourth Quarter, More Challenges To Come Says IDC " Feb 4, 2009, IDC. Available at http://www.idc.com/getdoc.jsp?containerId=prUS21659209
[20] "Measuring the Information Society." A report from the International Telecommunication Union, 2009, Page 3. http://www.itu.int/ITU-D/ict/publications/idi/2009/material/IDI2009_w5.pdf

have passed the digital conversion deadline, any expectations of someday reusing or donating these analog TVs will disappear, since few people will want analog TVs. Here are some statistics.

26.9 million televisions disposed in 2007	The EPA estimates that in 2007, we got rid of 26.9 million TVs – either by trashing or recycling them.[21] That's equivalent to 910,600 tons.
99 million TVs stockpiled	The EPA estimates that by the end of 2007, there were over 99 million TVs stockpiled or stored in the US.[22]
Over 35% of US households are affected by digital transition	According to the federal Government Accountability Office, 15% of households rely solely on over the air TV signal – the signal that will be unavailable if you don't have a digital TV or converter box. Another 21% of households have at least one TV that receives over the air signal.[23] With about 110 million households in the US, that means that approximately 40 million TVs may be affected.
How many TVs will be discarded?	There is no good data available for this question. We estimate tens of millions, but have no exact number.

Resource Recovery from Recycling Electronics

Gold recovery from e-waste recycling	"One metric ton (t) of electronic scrap from personal computers (PC's) contains more gold than that recovered from 17 t of gold ore. In 1998, the amount of gold recovered from electronic scrap in the United States was equivalent to that recovered from more than 2 million metric tons (Mt) of gold ore and waste.[24]

Resources Used in Electronics Manufacturing

To manufacture one computer and monitor, it takes 530 pounds of fossil fuels, 48 pounds of chemicals, and 1.5 tons of water.	"Finally, the production of electric and electronic devices is a very resource-intensive activity. The environmental burden due to the production of electrical and electronic products ("ecological baggage") exceeds by far the one due to the production of other household materials. A UN study found that the manufacturing of a computer and its screen takes at least 240 kg (530 pounds) of fossil fuels, 22 kg (48 pounds) of chemicals and 1.5 tonnes of water - more than the weight of a rhinoceros or a car (Kuehr and

[21] "Electronic Waste Management in the United States, Approach 1" Table 3.1 EPA530-R-08-009 US Environmental Protection Agency, July 2008. http://www.epa.gov/osw/conserve/materials/ecycling/docs/app-1.pdf
[22] IBID. Page 25.
[23] Digital Television Transition. Testimony before the House Subcommittee on Telecommunications and the Internet, June 10, 2008. Mark Goldstein, Government Accountability Office (GAO). P11 http://www.gao.gov/new.items/d08881t.pdf
[24] USGS Fact Sheet FS-060-01 July 2001. http://pubs.usgs.gov/fs/fs060-01/
[25] "E-waste, the hidden side of IT equipment's manufacturing and use," Environment Alert Bulletin, United Nations Environment Programme, January 2005. Available at: http://www.grid.unep.ch/product/publication/download/ew_ewaste.en.pdf

Williams, 2003)."[25]

81% of a desktop computer's energy use is in MAKING the computer, not using it

Energy Use

When you add up the energy usage during the whole lifecycle of a computer with a 17 inch monitor, you find most is used during manufacturing, not using the computer:

"In contrast with many home appliances, life cycle energy use of a computer is dominated by production (81%) as opposed to operation (19%)."[26]

A ton of used cell phones (6000 phones) yields $15,000 in precious metals.

Precious metals in cell phones

"A ton of used mobile phones, for example – or approximately 6,000 handsets (a tiny fraction of today's 1 billion annual production) -- contains about 3.5 kilograms of silver, 340 grams of gold, 140 grams of palladium, and 130 kg of copper, according to StEP. The average mobile phone battery contains another 3.5 grams of copper. Combined value: over US $15,000 at today's prices."[27]

Recycling metals from e-waste uses a fraction of the energy needed to mine new metals

Recycling aluminum uses saves 90% of energy of mining new aluminum

"Recovering 10 kilograms of aluminum via recycling, for example, uses no more than 10% of the energy required for primary production, preventing the creation of 13 kilograms of bauxite residue, 20 kilograms of CO2, and 0.11 kilograms of sulphur dioxide emissions, and causes many other emissions and impacts."[28]

Jobs and Reuse

Reuse Creates More Jobs

Compared to disposal, computer reuse creates 296 more jobs per for every 10,000 tons of material disposed each year.[29]

Quote references a compilation called, "Computers and the Environment. Understanding and managing their impact." Eric Williams and Ruediger Kuehr, Editors, United Nations University, October 2003.

[26] Energy intensity of computer manufacturing: hybrid assessment combining process and economic input-output methods, Eric Williams United Nations University, *Environmental Science & Technology* 38(22), 6166 - 6174 (2004).

[27] United Nations University (2009, September 17). Set World Standards For Electronics Recycling, Reuse To Curb E-waste Exports To Developing Countries, Experts Urge. *ScienceDaily*. Retrieved September 21, 2009, from http://www.sciencedaily.com /releases/2009/09/090915140919.htm

[28] IBID

[29] Institute For Local Self Reliance, "Recycling Means Business," 1997. http://www.ilsr.org/recycling/recyclingmeansbusiness.html