

## **Electronic Wasteland: Combatting the E-Waste Surge Through Federal Regulation**

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Ninety percent of American adults own at least one cell phone. Most will replace their phones within 18 to 24 months, even if the phone is still functional.<sup>[2]</sup> Assuming that this replacement cycle continues, the average Millennial will own at least 30 cell phones within his or her adult lifetime alone.<sup>[3]</sup> When this data is extrapolated to the Millennial population—which is already projected to surpass the Baby Boomers at 81.1 million people<sup>[4]</sup>—this will translate to billions of mobile devices that are consumed and discarded, in addition to other electronics, like computers, televisions, and tablets. As more technology-oriented generations begin to dominate the market and the average lifespan of electronics remains limited, the number of decommissioned devices will rise, leading to unprecedented levels of electronic waste (“e-waste”).

This is not a distant hypothetical scenario; it is already happening. In 2010, the Environmental Protection Agency (EPA) estimated that about 235.6 million mobile devices were sold within the United States.<sup>[5]</sup> The American population was about 308.7 million at the time.<sup>[6]</sup> By 2014, news outlets were reporting that the number of mobile devices in the world had surpassed the number of people,<sup>[7]</sup> that more people had access to cell phones than toilets,<sup>[8]</sup> and that many Americans maintained at least two mobile devices in order to separate their personal and business communications.<sup>[9]</sup> At the same time, American consumers do not know how to dispose of these electronics,<sup>[10]</sup> and federal laws and regulations<sup>[11]</sup> have been slow to react to this significant change in the waste stream.<sup>[12]</sup>

Americans dispose of tens of millions of mobile devices each year, in addition to computers, peripheral items like keyboards, and other technology that has made its way into our daily lives.<sup>[13]</sup> Many of these retired products are either dumped in local landfills,<sup>[14]</sup> where they present a risk of contaminating groundwater, or exported to countries like China, Ghana, and India, where the devices are reused or stripped for valuable materials.<sup>[15]</sup> Until December 2015,<sup>[16]</sup> Guiyu, China, was known as one of the prime examples of these operations: wires were openly

burned to obtain steel and copper, electronic chips were melted in acid to retrieve gold, plastics were recycled through chipping and melting, and leftover materials were openly dumped.

The current system of exporting U.S. e-waste is contributing to a phenomenon that is damaging the resources of receiving countries, creating problems in global manufacturing, and prompting receiving countries to attempt to close their borders to e-waste.[\[19\]](#) The U.S. produces such a large proportion of global e-waste, the majority of which is handled abroad, that any changes to the international waste stream could lead to a crisis that the U.S. waste infrastructure is not prepared to handle.

Both suggested and implemented regulations at international and national levels have been harshly criticized for their impact on national autonomy and free trade, as well as for their failure to address issues of diplomatic pressure. Many groups oppose a comprehensive ban on exports on the grounds that it would be paternalistic in nature and restrict developing nations' decision-making power.[\[20\]](#) Similarly, regulations on exports may run afoul of World Trade Organization agreements.[\[21\]](#) However, loose regulation also presents the problem of not providing equal grounds for bargaining between developed and developing nations, relying on notions of consent when denial may not be a realistic option.

Current U.S. environmental laws and regulations are not designed to address the unique issues posed by e-waste. The federal statute covering waste disposal, the Resource Conservation and Recovery Act (RCRA),[\[22\]](#) was written in 1976 and could not have predicted the advances in technology or changes in consumer culture that would occur in the next 40 years. As written, RCRA does not contain a category that encompasses complex electronics. Rather, it divides waste into that which is "solid" and that which is "hazardous."[\[23\]](#) Despite studies asserting that e-waste has toxic characteristics and can lead to environmental contamination, it has not yet been recognized as toxic waste under RCRA.[\[24\]](#) An e-waste bill, most recently titled the Responsible Electronics Recycling Act (RERA),[\[25\]](#) has been proposed in Congress several times; however, it has never passed.[\[26\]](#)

Though many state governments have stepped in to fill the gap left by federal regulations,<sup>[27]</sup> these programs do not cover a significant number of products and regions, and they have not developed quickly enough to make a significant impact on the waste stream. United States laws and regulations must be updated to address the changing waste stream and recognize the unique nature of discarded electronics. Moreover, a comprehensive system of regulation would help bring the U.S. into compliance with international standards and better meet the Environmental Protection Agency's goals of providing adequate protection for human health and the environment. E-waste has become a permanent part of the waste stream in the United States, and the rapid growth of the global electronics industry, which is causing waste receiver nations to rethink their own trade and disposal policies, indicates that Americans will not remain immune to e-waste's problems for much longer.

An amendment to the Resource Conservation and Recovery Act would provide the most efficient solution to the domestic handling of e-waste and the conditions under which it can be exported. Congress has already conducted several hearings on e-waste management, including one that addressed issues related to e-waste exports,<sup>[28]</sup> and the RERA has received bipartisan support.<sup>[29]</sup>

The problems associated with e-waste are complex and far-reaching. They will not be resolved through a few pieces of legislation, but federal laws can begin to build a framework for the safe and ethical handling of electronics. Electronics are a cemented part of modern life, and the industry will only continue to grow with the world population and the increased advancement and industrialization of nations. It is time for the United States, one of the leading consumers of this industry, to take an active role in reducing the impact that these products have, both at home and abroad.

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<sup>[1]</sup> As of January 2014. Pew Research Center, *Mobile Technology Fact Sheet*, PewResearchCenter (Dec. 27, 2013), <http://www.pewinternet.org/fact->

sheets/mobile-technology-fact-sheet/ [https://perma.cc/W6YZ-RU7C] (last visited Oct. 10, 2016) [hereinafter Pew Research Center].

[2] Based on data from 2007 to 2010. See Roger Entner, *International Comparisons: The Handset Replacement Cycle*, Recon Analytics (June 23, 2011), <http://mobilefuture.org/wp-content/uploads/2013/02/mobile-future-publications.handset-replacement-cycle.pdf> [https://perma.cc/C6FA-LWZ7]. See also UNEP, Information Note: Mobile Phone Partnership Initiative 1, <http://www.basel.int/Portals/4/Basel%20Convention/docs/pub/leaflets/leafMPPI.pdf> [https://perma.cc/GZ2U-2ZNZ].

[3] An average of sixty years. Jiaquan Xu et al., *Mortality in the United States, 2012*, Centers for Disease Control and Prevention, NCHS Data Brief No. 168 (Oct. 2014), <http://www.cdc.gov/nchs/data/databriefs/db168.htm> [https://perma.cc/U9Y2-GTPL].

[4] Projected to occur in 2036. Baby Boomers peaked at 78.8 million in 1999. The Baby Boomer and Millennial generations are each around 75 million currently. Pew Research Center, *This Year, Millennials Will Overtake Baby Boomers* (Jan. 16, 2015), <http://www.pewresearch.org/fact-tank/2015/01/16/this-year-millennials-will-overtake-baby-boomers/> [https://perma.cc/B77R-7CKD] (last visited Oct. 10, 2016).

[5] U.S. Env'tl. Protection Agency, EPA 530-R-11-002, *Electronics Waste Management in the United States Through 2009* 11 (May 2011) [hereinafter EPA Report], <https://nepis.epa.gov/Exe/ZyNET.exe/P100BKKL.txt?ZyActionD=ZyDocument&Client=EPA&Index=2011%20Thru%202015&Docs=&Query=&Time=&EndTime=&SearchMethod=1&TocRestrict=n&Toc=&TocEntry=&QField=&QFieldYear=&QFieldMonth=&QFieldDay=&UseQField=&IntQFieldOp=o&ExtQFieldOp=o&XmlQuery=&File=D%3A%5CZYFILES%5CINDEX%20DATA%5C11THRU15%5CTXT%5C00000001%5CP100BKKL.txt&User=ANONYMOUS&Password=anonymous&SortMethod=h%7C-&MaximumDocuments=1&FuzzyDegree=0&ImageQuality=r75g8/r75g8/x150y150g16/i425&Display=hpfr&DefSeekPage=x&SearchBack=ZyActionL&Back=ZyActi>

onS&BackDesc=Results%20page&MaximumPages=1&ZyEntry=1  
[https://perma.cc/78Z7-HMPT] (last visited Oct. 10, 2016).

[6] U.S. Census Bureau, *Age and Sex Composition: 2010 2* (May 2011), <http://www.census.gov/prod/cen2010/briefs/c2010br-03.pdf>  
[https://perma.cc/Z3FL-NJWR] (last visited Oct. 10, 2016).

[7] Zachary Davies Boren, *There Are Officially More Mobile Devices Than People in the World*, *The Independent* (Oct. 7, 2014), <http://www.independent.co.uk/life-style/gadgets-and-tech/news/there-are-officially-more-mobile-devices-than-people-in-the-world-9780518.html>  
[https://perma.cc/UDQ4-RKF2] (last visited Oct. 10, 2016).

[8] UN News Centre, *Deputy UN Chief Calls for Urgent Action to Tackle Global Sanitation Crisis* (Mar. 21, 2013), [http://www.un.org/apps/news/story.asp?NewsID=44452&Cr=sanitation&Cr1=#.Vhe\\_hvIVikr](http://www.un.org/apps/news/story.asp?NewsID=44452&Cr=sanitation&Cr1=#.Vhe_hvIVikr) [https://perma.cc/T3GG-VHRQ] (last visited Oct. 10, 2016).

[9] Elizabeth Holmes, *People for Whom One Cellphone Isn't Enough*, *The Wall Street Journal* (Apr. 1, 2014), <http://www.wsj.com/articles/SB10001424052702304432604579475303715000912> [https://perma.cc/73GY-B5UR] (last visited Oct. 10, 2016).

[10] Carl Smith, *Recycling Surveys Offer Some Surprising Results*, *Call2Recycle* (May 16, 2012), <http://www.call2recycle.org/recycling-surveys-offer-some-surprising-results-waste-recycling-news/> [https://perma.cc/BG7T-BU2U] (last visited Oct. 10, 2016).

[11] *See, e.g.*, 42 USC § 6901 *et seq.* *See also* Summary of the Resource Conservation and Recovery Act (May 18, 2015), <http://www2.epa.gov/laws-regulations/summary-resource-conservation-and-recovery-act>  
[https://perma.cc/7QDP-A952] (last visited Oct. 10, 2016).

[12] Jing Jin, *E-Waste & the Regulatory Commons: A Proposal for the Decentralization of International Environmental Regulation*, 39 *Brooklyn J. Int'l L.* 1251, 1253 (2014).

[13] U.S. Gov't Accountability Office, GAO-10-626, *Electronic Waste: Considerations for Promoting Environmentally Sound Reuse and Recycling* 3 (2010), <http://www.gao.gov/assets/310/307013.pdf> [<https://perma.cc/L7EK-3W79>]. See also Monica Anderson, *Technology Device Ownership: 2015*, PewResearchCenter (Oct. 20, 2015), <http://www.pewinternet.org/2015/10/29/technology-device-ownership-2015/> [<https://perma.cc/E7MD-EQTM>] (last visited Oct. 10, 2016) (“Today, 68% of U.S. adults have a smartphone, up from 35% in 2011, and tablet computer ownership has edged up to 45% among adults . . .”).

[14] Linda Luther, Congressional Research Service, *Managing Electronic Waste: Issues with Exporting E-Waste* 4 (2010), [www.fas.org/sgp/crs/misc/R40850.pdf](http://www.fas.org/sgp/crs/misc/R40850.pdf) [<https://perma.cc/R38U-GCB6>] (last visited Oct. 10, 2016).

[15] *Id.* at 3.

[16] The operations in Guiyu, which had continued despite the Chinese government's attempts to regulate e-waste recycling, were finally halted and moved to an industrial park. Michael Standaert, *China's Notorious E-waste Village Disappears Almost Overnight*, Basel Action Network (Dec. 17, 2015), <http://www.ban.org/news/2015/12/17/chinas-notorious-e-waste-village-disappears-almost-overnight> [<https://perma.cc/ZQN4-UZGG>] (last visited Oct. 10, 2016).

[17] Luther, *supra* note 14, at 3; see also Jim Puckett et al., *Exporting Harm: The High-Tech Trashing of Asia*, Basel Action Network (Feb. 25, 2002), <http://www.danwen.com/Etrash/technotrashfinalcomp.pdf> [<https://perma.cc/55SX-9VXX>].

[18] See Puckett et al., *supra* note 17.

[19] See, *About the OECD*, OECD, <http://www.oecd.org/about/> [<https://perma.cc/5T5V-QJWJ>] (last visited Oct. 10, 2016).

[20] See generally Jeanette Leary, *Proposed Export Ban on Electronic Waste: Unsalvageable Under WTO Analysis*, 26 *Geo. Int'l Envtl. L. Rev.* 435 (2014).

[21] See generally *id.*

[22] 42 USC 6901 *et seq.*; see also Summary of the Resource Conservation and Recovery Act (May 18, 2015), <http://www2.epa.gov/laws-regulations/summary-resource-conservation-and-recovery-act> [<https://perma.cc/K7YE-74EM>] (last visited Oct. 10, 2016).

[23] See Luther, *supra* note 14, at 6.

[24] *Id.*

[25] H.R. 2791, 113th Cong. (2013).

[26] Federal Legislation and Policy on E-Waste, Electronics TakeBack Coalition, <http://www.electronicstakeback.com/promote-good-laws/federal-legislation/> [<https://perma.cc/8DA5-9SLR>] (visited Oct. 10, 2015).

[27] See Brief Comparison of State Laws on Electronics Recycling, Electronics TakeBack Coalition (Sept. 19, 2013), [http://www.electronicstakeback.com/wp-content/uploads/Compare\\_state\\_laws\\_chart.pdf](http://www.electronicstakeback.com/wp-content/uploads/Compare_state_laws_chart.pdf) [<https://perma.cc/B6VV-VABE>]. See also Nick Raffaele, *iDump: How the United States Should Use Disposal Bans to Legislate Our Way Out of the Electronic Waste Crisis*, 39 Wm. & Mary Envtl. L. & Pol'y Rev. 483, 485 (2015).

[28] *Exporting Toxic Trash: Are We Dumping Our Electronic Waste on Poorer Countries? Hearing Before the Subcomm. on Asia, the Pacific, and the Global Environment*, 110th Cong. (2008), <https://www.gpo.gov/fdsys/pkg/CHRG-110hrg44529/pdf/CHRG-110hrg44529.pdf> [<https://perma.cc/2CWL-XQH7>].

[29] See Federal Legislation and Policy on E-Waste, *supra* note 26.