CONSUMING JUSTICE: EXPLORING TENSIONS BETWEEN ENVIRONMENTAL JUSTICE AND TECHNOLOGY CONSUMPTION THROUGH MEDIA COVERAGE OF ELECTRONIC WASTE, 2002-2013

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DISSERTATION ABSTRACT

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Title: Consuming Justice: Exploring Tensions Between Environmental Justice and Technology Consumption Through Media Coverage of Electronic Waste, 2002-2013

The social and environmental impacts of consumer electronics and information communications technologies (CE/ICTs) reflect dynamics of a globalized and interdependent world. During the early 21st century the global consumption of CE/ICTs expanded greatly while the infrastructure behind CE/ICTs, especially the extraction and disassembly phases, became more integrated. This dissertation examines how messages about the social and environmental impacts of CE/ICTs changed during this period and explores the discursive power of actors involved in environmental justice campaigns surrounding the disposal and disassembly of electronic waste (e-waste).

The dissertation reports the results of a mixed methods investigation of twelve years of media coverage of e-waste through quantitative content analysis and qualitative document analysis. The analysis examined almost 800 articles from eleven media outlets between 2002 – 2013 and explored differences between legacy media coverage (e.g. *The New York Times*, *USA Today*) and coverage from digital news outlets focused on technology (e.g. *Ars Technica*, *CNET*, *Gizmodo*).

When the story of e-waste began to gain traction in media outlets, the haze of commodity fetishism cleared for a brief moment and the social relations of exploitation

behind the wonders of technology were included in media narratives. While the media coverage about e-waste initially examined environmental justice issues of pollution and labor exploitation, the coverage evolved into focusing on the technical and business solutions to managing the environmental problems and the growth of a private sector profiting from mineral reclamation through electronics recycling.

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CHAPTER I

INTRODUCTION

On September 13, 2011, the Apple Corporation banned an iPhone game application called *Phone Story,* a mobile phone game whereby players learn about the life cycle of their smart phones. Players learn about the minerals used to make their phones vibrate, the factory conditions where the phones are made, and finally, what happens to phones when they are no longer needed or stop working. Apple claimed the game was banned due to violations of its application creation agreement including that the game depicted "child abuse ... [and] objectionable or crude content" (Brown, 2011). *Phone Story* creator Molleindustria says the goal of the game is for players to "compete with market forces in an endless spiral of technological obsolescence" (Molleindustria, 2011). While it is not surprising that a corporation like Apple might object to the graphic and interactive depiction of their exploitative profit-making system, it does seem slightly surprising that Apple played so well into the game developer's publicity. By banning the satirical game, Apple likely expanded the media coverage of the game and possibly awareness of the core issues and concerns that the game sought to illuminate. The *Phone Story* event was perhaps a blip in the news cycle, but the incident is part of a larger history of struggle to illuminate the "social apparatus" of technology (Schaefer & Durham, 2007, p. 41).

While a mobile phone game application is a relatively new venue for activist communication and educational strategies, for more than 30 years, social and environmental justice movement organizations and networks have worked to raise awareness and change policies in order to reduce the social and environmental impacts of

information and communication technologies (Smith, Sonnenfeld, & Pellow, 2006). Particularly in the last decade, there has been increased media attention to some of these concerns, especially regarding the production, consumption, and disposal of personal computers, consumer electronic devices and mobile phones. A range of media outlets have covered violence over the minerals and natural resources that comprise handheld devices like mobile phones (McConnell, 2010; Steans, 2011; D. Taylor, 2011); sweatshop labor in manufacturing and distribution chains for production (Barboza, 2010; Ferus-Comelo, 2008; Guo, Hsu, Holton, & Jeong, 2011; McEntegart, 2010; USAS, 2010; Viticci, 2010); and electronic waste (Carroll, 2008; Claiborne, 2009; Ford, 2009; Granatstein, 2008; Gronewold, 2009; Nfanga, 2008; Olson, 2009; Walsh, 2008). In their investigations of the materiality of technology, Schaefer & Durham (2007) argue that people need "to view the machine ... as embedded by social forces" (p. 52). I am interested in how that happens–how do people learn about the social forces that surround technologies like consumer electronics? Where does this information come from, and does it reflect similar social forces?

Despite the expanded coverage of these serious social and environmental justice issues, it is unclear how much of an impact these revelations have on changing and challenging the larger macro-level structures that permit (and profit from) such exploitation. At various governance levels (international, national, and state) and within corporate self-regulation programs, some policy shifts are occurring. Yet at the same time, global economies are increasingly tied to the growth of the consumer electronics and information communications technologies industries (CE/ICT), which rely on expanding consumption and increasing demand for the various CE/ICT commodities.

These contrasting trends do not seem reconcilable–given this tension, how has the story of the consequences of production, consumption, and disposal of CE/ICTs been told?

The *Phone Story* mobile phone application attempts, through satire and play, to illuminate a range of social and environmental justice concerns that the production, consumption, and disposal of technology encompasses. Yet, even as the news story of Apple's decision to ban the *Phone Story* game spread through the internet, a little more than two weeks earlier, the *Wall Street Journal* had noted that advocacy campaigns around conflict minerals and violence in the Congo tell "an appealingly clear-cut narrative, one in which corporate greed provoked abject misery" (Steans, 2011, para 2) and one that "attempts to impose a simple causal arrow on a mess of narrative strands" (para 5). The intended audience for a smart mobile phone application (and a subsequent banning of the game and corporate censorship media story) is likely, though not necessarily, different, from the intended audience of the *Wall Street Journal*. These different approaches to discussing, articulating, and framing the social and environmental impacts of ICTs reflect, in many respects, the "relational process" of hegemony (DeLuca, 1999, p. 94).

How do media narratives and framings about the materiality of technology reflect dynamics and conflicts between activist goals and corporate priorities? What role do media narratives and framings play in the shifts in policies? In little more than a decade, there have been significant shifts in how technology product life cycles are discussed by a variety of actors. A new industry has developed around the problems of mineral extraction and reclamation related to ICTs, sometimes referred to as "urban mining" (Jung, 2011). In July 2011, the United States government released a report encouraging

the phrase “used electronics” instead of “electronic waste or e-waste” (Interagency Task Force on Electronics Stewardship, 2011, p. 5). While there are accounts of the history of the activist campaigns, corporate responses, and policy struggles, there are limited accounts of how the shifts in discourse and narratives occurred (Edge, 2011; David Naguib Pellow, 2007; Smith et al., 2006). Media coverage is often used as evidence of these conflicts, yet there has not been an extensive investigation to determine the strength, resonance, and scope of frames and narratives within the media coverage of the social and environmental consequences of CE/ICTs.

This dissertation examines 12 years of media coverage of electronic waste through quantitative content analysis and critical interpretative document analysis to examine how media have communicated the inherent tensions between environmental justice and capitalism. Because electronic waste is an environmental justice issue but is also about technology consumption, this study fills gaps in the literature that studies media coverage of technology and environmental social movements through comparing popular, digital news sources (e.g. *Ars Technica*, *CNET*, *Gizmodo,* and *Wired*) and legacy news sources (e.g. *The New York Times*, *Wall Street Journal*, and *The Washington Post*).

The research explores the range of discursive power that various actors wielded and examines if and how messages about the social and environmental impacts of CE/ICTs have shifted. Drawing on critical political economy of communication and ecological materialist media studies of CE/ICT infrastructures, this project incorporates post-colonial critiques and critical-constructionist framing analysis, and research about media coverage of environmental issues, policy and social movements to investigate how these different messages relate to “different social interests” (Philo, 2007, p. 185). The

project builds upon previous accounts of e-waste and environmental justice activism framing and messaging (Edge, 2011; Maxwell & Miller, 2012; Maxwell, Raundalen, & Lager Vestberg, 2015; David Naguib Pellow, 2007; Smith et al., 2006; Sterne, 2007). The broader aim of the research is to investigate how the media story of electronic waste changed over time and to what extent did it reflect perspectives supporting "sustainable global consumerist capitalism" compared to counter-hegemonic environmental justice perspectives (Sklair, 2008, p. 224). This research study seeks to contribute towards understanding why the story of e-waste evolved in the ways that it has. The following research questions guided the investigation:

RQ1. How does the media story of electronic waste change over time?

RQ1a. What differences exist between legacy and digital media coverage about electronic waste?

RQ2: To what extent did legacy and digital media news coverage of electronic waste reflect environmental justice or sustainable capitalism perspectives?

RQ2a: What social and environmental justice issues are present and absent in the coverage of electronic waste? How did media coverage of electronic waste portray environmental activism?

RQ2b: How were issues of digital inequalities and consumerism discussed in the coverage of electronic waste?

The next section provides some context on the environmental justice movement and the ecological and social impacts of ICTs and consumer electronics, followed by an overview of the chapters of this dissertation.

1.1. Electronics and the Environment

Grossman (2007) notes that the material complexity of ICT products "pose[s] a considerable challenge to those trying to produce an accurate life-cycle analysis of high-tech manufacturing" (p. 43). Studies that examine ICT life cycles seek to demonstrate the potential environmental impacts and effects of toxic materials and energy consumption throughout the production cycle. Electronic media products contain a variety of toxic heavy metals such as mercury, lead, and cadmium as well other likely carcinogens such as polyvinyl chloride (PVC) and trichloroethylene. Electronic devices also require rare earth metals like gold and silver[1] and tantalum (used in capacitors for electronic storage and in portable devices) which are fraught with historic and current resource driven and/or supported conflicts (Eichstaedt, 2011; Le Billon, 2001; Mantz, 2008). Tantalum, made through coltan, has become "a blood diamond of the digital age," especially in the Democratic Republic of Congo, where money from coltan production fuels internal violence in civil wars (Mantz, 2008, p. 36).

Yet dynamics of supply and demand are in place, even when well-intentioned policies are enacted. For example, in Europe, the use of lead was banned in the production of electronic components through the European Union's Restriction of Hazardous Substances (RoHS). However, "banning certain materials may result in the use of alternatives that may be no better than what's being banned–or that may have new and different detrimental impacts" (Grossman, 2007, p. 51). While the removal of lead from electronics production was a good idea, producers replaced the manufacturing process with tin, thus making the price of tin increase, which benefited owners of tin

[1] Mobile phone and personal computer manufacturing is estimated to annually consume 3 percent of gold and silver mined globally (United Nations University, 2010).

[2] The United States signed in 1990 and the treaty was ratified by the U.S. Senate two years later, however, because the "implementing legislation" has not passed through Congress, the treaty cannot be officially ratified. The primary legislation that must be updated is the Resource Conservation and Recovery Act of 1976 (RCRA) (Angelo et al., 2012, pp. 16–17).

mines and reserves, like in the Democratic Republic of Congo. Tin, like coltan, became another valuable commodity used to fund internal violence.

The ICT production process is also resource intensive. In 2007, researchers estimated that "the ICT industry was responsible for more than two percent of the global CO2 emissions" (Sacchero & Molla, 2009, p. 1066). Williams et al. (2008) estimate that energy used in manufacturing one desktop home computer "could be as high as 4 times greater" then the energy used to run that same computer (2008, p. 6447). These manufacturing processes, especially for semiconductor chips, also require massive amounts of fresh water consumption and contribute to substantial groundwater contamination (Byster & Smith, 2006b, p. 206).

The environmental impacts of ICTs do not end with the resource intensive and polluting production and manufacturing processes. After the devices are no longer used, they are disposed by their users. In 2014, the amount of e-waste generated in the United States had grown to 7.1 million tons (in absolute quantities), with 15 percent of this waste being "officially reported as collected recycled" by the EPA (Balde, Kuehr, & Huisman, 2014, p. 40). Almost 70 percent of toxic heavy metals in US landfills are from disposed electronic devices or electronic waste (Grossman, 2007). In addition to electronic waste that ends up in landfills, incinerators and garbage dumps in the United States, much of the waste is delivered, often illegally, to developing countries where disposal regulations and enforcement can be more lax. Many of the images and news reports about the dumping of electronic waste in developing countries show informal electronic recycling sites.

Non-governmental, advocacy organizations like Basel Action Network and the

Silicon Valley Toxics Coalition have conducted investigations into the patterns of developed countries like the United States illegally disposing their electronic waste in China, Nigeria, and Ghana. These investigations revealed that not only were the broken electronics being disposed in developing countries, but these disposal sites also had extensive recycling operations with few human safety or environmental protection systems (Basel Action Network & Silicon Valley Toxics Coalition, 2002a; Puckett, Westervelt, Gutierrez, & Takamiya, 2005).The informal sector locations are highly toxic sites where electronic waste is dumped, sorted, and manually dismantled, with the metals collected through open burning (Coren, 2009; Ford, 2009; Granatstein, 2008; A. Lewis, 2010; Mangini, 2009; Puckett, 2007). The World Health Organization (WHO) has noted that chemicals in e-waste are "proven or suspected to cause human health effects" such as cancer (PCBs, dioxins, chromium, arsenic), damaged DNA (copper, mercury, nickel, iron), endocrine disruptors (mercury, copper, manganese), neurodevelopment and brain function problems (lead, mercury, cadmium), reproductive problems (chromium, lead, dioxins) and bone, liver, lung and kidney problems. Children and pregnant women are highly sensitive to these toxins and are involved in e-waste labor and live near highly polluted informal disassembly sites. According to WHO research,

> pregnant women in e-waste recycling towns are more likely to give birth to small infants, and that exposed children are also at risk of reduced IQ, attention deficits, lung damage, DNA damage and cancer (World Health Organization, 2017, p. 89).

The U.S. Environmental Protection Agency (EPA) estimated that 2.9 million tons of electronic waste (e-waste) were generated in the United States in 2006 and of this, less than 12 percent was recycled (Environmental Protection Agency, 2008). Partially in

response to these investigations and subsequent mainstream media attention, the U.S. government initiated a range of investigations into electronic waste disposals. In 2008, the director of the Natural Resources and Environmental Division of the U.S. Government Accountability Office (GAO) testified before the U.S House of Representatives that "used electronics flow virtually unrestricted" from the United States to other countries as a result of limited regulation and enforcement (Stephenson, 2008, p. 2). Almost a decade later, these flows of toxic dumping and under/unregulated electronics recycling markets continue (K. Campbell & Christensen, 2016; Koebler, 2016).

Consumption and disposal of electronics products continue to rise in the United States (and globally). In the United States, 67 million new computers were sold in 2007 (Environmental Protection Agency, 2008). The Consumer Electronics Association (CEA), reported in 2006 that US$145 billion was spent on consumer electronics in the United States (Maxwell & Miller, 2008a, p. 339). Even with the global economic recession of 2008, this rate of consumption of consumer electronics continued to steadily increase. The CEA reported that in 2010, the "average" US household spent 12 percent more on consumer electronic devices than the previous year and estimated that average US households owned 25 consumer electronic products. The CEA notes tellingly that "consumers will continue to view consumer electronic products as necessities in their lives" (Kidera & Pollock, 2010, p. para 1–3). By 2016 retail sales of consumer electronics and technologies had increased to US$287 billion, and the organization notes that for 2017, "technology sales are predicted to hold steady with a slight uptick, reflecting the entrenched nature of the industry" (CTA, 2016, p. 1).

Increasingly, e-waste is no longer just a North to South, or developed regions to

developing regions, transfer of pollution and toxic waste. Recent estimates predict that "the volume of obsolete PCs generated in developing regions will exceed that of developed regions by 2016-2018" (Yu, Williams, Ju, & Yang, 2010, p. 3232). Global spending on computing devices reached 244 billion dollars in 2014, and at the end of 2015, market analysts predicted that 2.5 billion units of new electronic devices will be shipped globally (Gartner Research, 2015). These new devices are replacing older devices but are also reflective of the increase of devices generally, resulting in continuing increases of e-waste. The United Nations University reported that in 2014, 41.8 million metric tons of e-waste was produced globally and that this amount was expected to increase by almost twenty percent by 2018 (Balde et al., 2014, p. 8).

The digital television transition, which occurred in the United States in June 2009, is also estimated by environmental activists to contribute additional e-waste problems due to toxic materials like lead in cathode ray tubes of older televisions discarded by consumers in response to the digital TV transition (Electronics TakeBack Coalition, 2009). The *New York Times* reported that the Basel Action Network estimates that at least 80 percent of analog televisions that are recycled will be exported illegally to China for recycling (Gronewold, 2009). The environmental and social consequences of electronics reflects a range of complex issues that are linked to the environmental justice movement– which aims "to account for the whole life cycle, places, supply chains, and flows of electronic technologies and materials" (Iles, 2004, p. 93).

1.2. Environmental Justice

The environmental justice movement began in 1982 when a poor and

predominately African American community in rural North Carolina worked with local civil rights organizations to organize a successful and lengthy protest against an EPA decision to locate a toxic waste dump in the community. What distinguished this protest from other environmental activism up to that point was the clear linking of civil rights and social justice to environmental pollution. Institutional racism and classism in the regulation of environmental issues, particularly toxic disposals, created significant health risks for low-income, minority communities (Anand, 2004; Swain, 2009). The environmental justice movement was the first social movement "to link environment and race, class, gender and social justice concerns in an explicit framework" (D. E. Taylor, 2000, p. 542). Environmental justice prioritizes "targeting the production of risk as a structural or systemic property of the global economy" (Iles, 2004, p. 90).

The environmental justice movement expanded beyond the United States reflecting many of these themes and dynamics at the global level, particularly toxic disposals from developed countries to less developed countries (Anand, 2004). Historical accounts of the environmental justice movement detail the work of activist organizations like the Silicon Valley Toxics Coalition's campaigns to reduce toxic pollutants from ICT production processes and Greenpeace International's campaigns around toxic dumping, including waste generated from electronic production and disposal (Anand, 2004; Grossman, 2007; David Naguib Pellow, 2007; Smith et al., 2006). Anand's (2004) comprehensive review of the history of the environmental justice movement's involvement with international policy and regulations surrounding toxic waste disposal traces the policy process that eventually culminated in the Basel Convention of 1989 and the subsequent Basel Ban amendment of 1995. The Basel Convention sought to regulate

the exportation and disposal of toxic and hazardous waste. Developed countries, like the United States, due to stricter regulations and higher costs for domestic toxic disposal, have used developing countries as "dumpsites" for hazardous, toxic waste, which reflects a form of "toxic imperialism" (Anand, 2004, p. 64). However, the Treaty was stymied through corporate interests in United States (Anand, 2004; David Naguib Pellow, 2007). As of 2017, 186 countries have joined the Basel Convention (Secretariat of the Basel Convention, 2017). The Basel Convention is "one of the most ratified treaties in the world" and the only countries who have signed the treaty but not ratified it are the United States[2], Haiti, and Afghanistan (Angelo et al., 2012, p. 15).

These international agreements stipulate conditions for disposal and recycling of toxics, including electronic waste, yet there are serious challenges for enforcement of the policies (Iles, 2004). Partially due to the lack of international agreement, support and enforcement of toxic disposal regulations and treaties, the European Union passed a series of policies that included the concept of extended producer responsibility, which places the fiscal and legal responsibility for disposal of electronic devices upon the manufacturers of the devices.[3] In the United States and Canada, a patchwork of regulations continue to allow for the use of toxic materials in the production process as well as improper and illegal dumping of electronics waste on poor and marginalized

[2] The United States signed in 1990 and the treaty was ratified by the U.S. Senate two years later, however, because the "implementing legislation" has not passed through Congress, the treaty cannot be officially ratified. The primary legislation that must be updated is the Resource Conservation and Recovery Act of 1976 (RCRA) (Angelo et al., 2012, pp. 16–17).

[3] In 2003, the European Union enacted the Waste Electrical and Electronic Equipment (WEEE) Directive. The WEEE Directive and the Directive on the Restriction of the Use of Certain Hazardous Substances in Electrical and Electronic Equipment (2002/95/EC) or the Restriction of Hazardous Substances Directive (RoHS Directive) were adopted in July 2006. The goal of the legislation is to incorporate the precautionary principle in electronics production processes through banning toxic heavy materials (lead, mercury, cadmium and hexavalent chromium) and two brominated flame retardants while also holding manufacturers financially responsible for disposal of electronic waste.

communities throughout the developing world. In response to the failure of policy and regulations to effectively reduce and improve environmental and social effects of electronics, a variety of social movement organizations and campaigns developed. While some, like the Silicon Valley Toxics Coalition (SVTC) , focused on the problems of production of ICTs, others, like the Basel Action Network (BAN) formed in direct response to the failure of the global enforcement of the Basel Treaty. These groups, along with the global growth of the environmental justice movement since the 1990s, have been remarkably successful in bringing media, policy maker, and consumer attention to the problems of e-waste (Edge, 2011; Gabrys, 2011; Grossman, 2007; Smith et al., 2006). Appendix A provides a timeline of events relating to the political struggle over environmental justice and ICTs.

1.3 Dissertation Chapters

Chapter 2: *Theoretical frameworks and literature review*. Using the frameworks of critical political economy of communications and ecological materialist media infrastructures studies, environmental sociology and social movement studies, as well as development communication assessments of media, social justice and technology transfers, the chapter reviews research about CE/ICT infrastructures, technology consumption, discourses of waste and garbage, environmental justice social movements, and journalism studies. Throughout the chapter, I also present context and research about e-waste issues and activism.

Chapter 3: *Methodology.* After reviewing the methodological framework of critical realism and strong objectivity, I examine the methods of content analysis and document

analysis. I also review the media outlets used in the study as well as the procedures and processes used to conduct the research.

Chapter 4: *Comparing coverage e-waste, 2002 – 2013.* I present the results and discussion of the content analysis findings, focusing on how coverage of e-waste changed over time and between media types.

Chapter 5: *Environmental justice and sustaining capitalism.* This chapter uses critical document analysis to explore how media coverage of electronic waste reflected environmental justice or sustainable capitalism perspectives. Through this discussion, the chapter also examines what other social and environmental issues were addressed (or not) in coverage, while also assessing how environmental activism, digital inequalities and consumerism were portrayed in the media coverage.

Chapter 6: *Conclusions.* This chapter assesses the links between the findings and provides an integrated interpretation and overall review of the research questions and analysis. The chapter concludes with a discussion of limitations, contributions, and future research.

CHAPTER II

FRAMEWORKS AND LITERATURE

This chapter is divided into six main sections as summarized below: Using the frameworks of critical political economy of communications and eco-materialist media studies, section one explores the concepts of commodities, the social forces of design/obsolescence and the circuits of exploitation in CE/ICT. I then explore the links between studying technology news coverage of the CE/ICT infrastructures and neoliberal hegemony.

Section two uses development communication of ICTs and for social justice to discuss relationships between CE/ICT infrastructures and neoliberal globalization theorizing. I examine the history of ICT4D, post-colonial and post-development critiques of development and technology discourses as well as political economic critiques of digital inequalities and technology myths. I then review a brief history of sustainable development, the sustainable development goals, and ICTs. Section two concludes by exploring the relationships between development, sustainability, technology and environmental justice.

Grounded in environmental sociology, section three reviews the concepts of Anthropocene, ecological Marxism, ecological modernization and sustainable capitalism. Using these concepts I examine electronics recycling certification programs and corporate and activist environmental rankings of CE/ICT companies.

Using social movement studies and theories about social movements and media, section four explores framing theory and social movements, focusing on critical-constructionist framing. This section also reviews transnational social justice and locates

the e-waste activist network within this tradition. After reviewing scholarship on the e-waste activist network, I then outline key documents from and about the e-waste activist network that I draw upon for my research project and review the environmental justice paradigm.

Section five reviews research from environmental communication: content analysis of climate change, rhetorical analysis of toxics, discourse analysis of risk communication and visual analysis of e-waste. I then review of critical garbage and waste studies, highlighting links between post-colonial analysis and discourses of waste and garbage. The remainder of this section is focused on public relations and environmental activism, exploring neoliberal rhetorical strategies of the coal industry's public relations campaigns.

Finally section six examines the relationships between public relations and journalist sourcing patterns and reviews the role of NGOs as journalistic sources and researchers. After discussing trends in news consumption, I then outline a brief history of technology journalism. I conclude with a brief discussion of the links between technology and science news and environmental journalism. The chapter closes with a visual overview of the intersections between these six sections of the chapter and reviews the project's research questions.

2.1. Critical Political Economy of Communications

Critical political economy of communications (CPEC) offers scholars important theoretical and analytical approaches to investigate the range of social and power relations embedded within information communications technologies. Derived from the

critical political economy tradition, CPEC is similarly characterized by a focus and analysis of the broad social totality, moral philosophy, praxis and historical analysis of social change and power. Mosco (2009) argues for a political economy that moves beyond focusing on the historical reproduction of structures and more on the "constituting processes" of history in relation to social structures and social reproduction (Mosco, 2009, p. 27). Furthermore, CPEC is inherently interdisciplinary and is committed to investigating issues of justice and asymmetrical power relations. This research project is inspired by these approaches to critical political economy of communication and takes them as a launch point for the other theoretical and research traditions that guide the analysis.

Critical political economy of communication investigates the processes through which media systems consolidate and exercise power within capitalism. These processes include the "dynamics" of symbolic management or meaning production, how texts "are mechanisms for regulating public discourse" through privileging some texts (and discourses) over others due to economic dynamics, and how cultural consumption (and participation) is influenced by economic, spatial and temporal factors (Murdock & Golding, 1995, p. 85). Murdock and Golding (1995) do not see this as economic determinism; rather they see, like Hall (1982), that critical political economy looks at the economy, "in the first instance" but it (economics) is not the only instance (or the base) of analysis (p. 74).

Applied to communications research, critical political economy has a lengthy theoretical tradition that investigates media institutions' influence on social systems and the uniqueness of "media as commodities" (Wasko, 2004, p. 312). Media commodities

are unique for a variety of reasons, including: they have limited or unlimited scarcity due to digital capabilities; they can facilitate and transmit ideas and democratic processes; and they involve creative labor and facilitate/support other industries (Mosco, 2009). Information and communication technologies, in particular, have a dual status as "both objects and media" (Silverstone, Hirsch, & Morely, 1992, p. 21).

2.1.1. Commodities

Two important aspects of Marx's analysis of commodities continue to be relevant to the study of media commodities generally and more specifically to consumer electronics. First, the social relations of power and exploitation are embedded within the commodity, and the commodity form hides these forces. Second, commodity fetishism, which positions the commodity as a real entity in itself—one that has real, mysterious powers which furthers the separation and concealment of the social relations of extraction, production and exploitation that created it. Mosco's work on the "digital sublime" thoroughly shows how the computer is particularly well suited to this process of reification, fetishism, and technology myth making (Mosco, 2004).

The design and technical specifications of consumer electronics increasingly facilitates even more obscuring of the social relations behind the products. Marx's "fantastic form"[4] of commodities becomes even more fantastic when product design is examined critically (1976, p. 176). Schaefer and Durham have noted that "paradoxically, as the ubiquity of digital technologies increase, their physical presence decreases" and that "design guides use, and the limited tactile and visual presence [of digital

[4] As Marx (1976) originally noted, a commodity "is nothing but the definite social relation between men themselves which assumes here, for them, the fantastic form of a relation between things" (p. 165).

technologies] disorients the user" from the already difficult challenge of seeing commodities within the social totality of the power relations that guide their production, consumption, and disposal (2007, pp. 40, 47). Schaefer and Durham's analysis focused on the design of the Apple G5 desktop computer in 2005. Design increasingly "aims to dissolve the divide between its software and hardware in use" (Micklethwaite, 2015, p. 24). Many regular objects or commodities currently do have microchips embedded in them–most are or soon will be internet enabled, part of the "the internet of things." As of late 2016, Cisco estimated 15 billion "everyday" devices are considered to be part of "the internet of things"[5] and by 2020, possibly 50 billion will be online; Intel optimistically estimates approximately 200 billion devices by 2020 (Sanger & Perlroth, 2016).

In May 2015, Google and clothing manufacturer Levi Strauss announced the latest in smart apparel – clothing made with conductive fibers and linked via Bluetooth to the wearers' phones and other devices – described by one executive as a way for "people to liberate themselves from devices" (Hyland, 2015). The larger project of conductive material design is called Project Jacquard. Google's promotional video for the project offers some nice insights into these tensions of between understanding electronic devices as immaterial and material commodities.

> If you can hide, or weave, interactivity and input devices into the materials …this would be the first step into making computers and computing invisibly integrated into the objects and materials in clothing.
>
> It is interesting because it is something you are very familiar with–it's just textiles.
>
> Jacquard is an interface, that is blended into the clothing that we wear – that has an implication in the way that you would use services, products

[5] These devices were used in a "massive denial-of-service attack" on October 21, 2016. The attackers used "botnets made from thousands of hacked embedded systems in … devices like home security cameras and video recorders" (Doctorow, 2016).

> applications and anything that we do through our devices. It's somehow getting the technology out of the way and making interactions more natural and more seamless.
>
> What's amazing about the project is that I don't have to have any knowledge of the electronics and how it works. (Google Advanced Technology and Projects, 2015)

Google's advertising for the conductive material highlights the challenges for people (consumers) to understand the social forces embedded into commodities. Google wants the wearer to not think about the technology. This is not an abstraction; this is the goal of the product. One key area that is not included in the promotional materials for the conductive fabrics is how they will be disposed of. Clothing already is hugely problematic in terms of environmental impacts in landfills. The "fast-fashion" cycle of clothing design, manufacturing and consumption has been called "landfill fashion" due the speed at which clothing is thrown away or falls apart because of cheap design (Zarroli, 2013). While Project Jacquard's conductive fabrics are not yet available en masse, it remains to be seen if smart jeans will become the latest category of e-waste and fashion waste[6].

The narrative that Google is spinning surrounding its conductive fabric obscures the larger intentions behind the innovation. Faraone's work ideology and advertising is helpful here:

> Buyers are constantly encouraged to acquire the latest machines and software, which are presented in the market in a succession carefully programmed by the companies. While promotional publicity presents innovations and "breakthroughs" exclusively as products of scientific-technological development, they are in fact determined by the corporate

[6] In late 2016, Nike released a special edition shoe – the "HyperAdapt" which modeled after a 'self-tying' shoe from the movie *Back to the Future Part II*. The shoes electronically seal themselves to the wearer's foot. (Tong, 2016) Shortly after, Puma announced a similar product – the "Autodisc" sneakers which offer the "real advantage" of "smartphone connectivity" to adjust the laces (Lai, 2016).

drive for present and future economic benefits. (Faraone, 2011, p. 190)

Faraone reminds us that beneath the veneer of the technologies and electronic gadgets that continue to expand, seemingly ceaselessly into more areas of life, is that the whole nature of capital is to expand in the pursuit of profit. That there are more and more types of devices is not a scientific or technical necessity–there are more and more devices and electronic products because more profits are needed in order to sustain capitalism. Baran and Sweezy (1966) identified the role of stagnation and the subsequent sales effect that seeks to decrease stagnation and increase profits. The sales effect, or manufactured desire for consumption of products through advertising and marketing, is a big contributor to product production processes due to "extensive packaging, cosmetic changes in products, new models and fashions, branding, and product obsolescence – all aimed at increasing the consumer's propensity to buy a particular product" (McChesney, Foster, Stole, & Holleman, 2009, p. 7). The existence of capitalism is entirely predicated on constant expansion; "cannot exist without constantly expanding the scale of production" (Foster, 2005, p. 14).

While the impact of the sales effect upon product design and production is an important category of analysis, what we are talking about is waste–and the role that waste plays within the tendencies of capitalism. In *The Grundrisse*, Marx connected the relationship between consumption, production and waste noting that

> consumption produces production in a double way, 1) because a product becomes a real product only by being consumed…the product...becomes, a product only through consumption. Only by decomposing the product does consumption give the product the finishing touch (Marx & Engels, 1978, p. 229)

As Van Loon (2002) observed, "without active wasting, we would not 'need' constant intensification of product life cycles, as there was no need for absorbing ever

greater amounts of surplus supply" (pp. 120–121). Product obsolescence is more than just poorly design products that require upgrades and replacements as a side effect of companies' profit making requirements. These upgrades and replacements are the driving force to accumulate more surplus value and profits, at a continually expanding rate. The waste that the replaced, broken, old, or just not new enough products create is necessary to the profit margins.

2.1.2. Obsolescence

The ICT industry accounts for the rapid growth, development, and consumption of consumer electronics as a result of Moore's law. Moore's law is both a mathematical calculation and a narrative told about and by the ICT industry. In October 1965, Gordon Moore, founder of Intel, published "Moore's First Law," which basically predicted that the speed of computing processing would exponentially increase every two years (Intel Corporation, 2017). The real world applications of Moore's law, seen in the profits and fortunes in corporations like Intel and other information communications technologies (ICTs) companies, are that with increased processing speed potential, new products can be released in quicker succession, creating, as Barlow notes, a self-fulfilling prediction – "it now has to be true, since the entire computer industry and a good deal of the world economy depend on it continuing" (2004, p. 182). In many respects, Moore's law becomes shorthand for why so many consumer electronics are "released" onto the market. The mathematical and engineering elements become lost as the story becomes an effective way to not discuss the social relations of ICT production, consumption and disposal. However, as political economists have demonstrated, it is not just a math

formula that determines when and why products are released or become obsolete.

According to historical scholarship about obsolescence, early planned obsolescence developed out of the automobile industry and the development of the used car industry. The United States automobile industry of the 20th century "served as a model for manufacturers and dealers of other consumer goods." At the beginning of the electronics industry in the early 20th century, there were similar attempts to build an infrastructure for re-use and repair modeled off of the auto industry used car and repair markets. Strasser uses early trade journals to note that in 1929, the radio manufacturers were asking "Are Used Sets Like Used Cars?" and that there was an infrastructure of radio repair and reuse shops but this was eliminated over the 20th century (Strasser, 1999, pp. 191–196).

The term "planned obsolescence" was not used until 1955, "when *Business Week* described the expansion of 'planned obsolescence' from the auto industry to the marketing of consumer goods in general." Strasser discusses the work of Martin Mayer, who saw obsolescence as planned (materials designed to break down); functional (technology improves, changes); and stylistic (fashions, colors, etc. dictate when products are no longer used). But it is Vance Packard's book published in 1960, *The Waste Makers*, which Strasser identifies as the first critique of planned obsolescence (Strasser, 1999, pp. 274–275).

According to Strasser, Packard saw some functional obsolescence as a good thing, whereby technology improves the actual function of the product, while planned or designed obsolescence created shoddy products "designed for quick replacement". Strasser characterizes the impact of Packard's main critique of planned obsolescence as

being "outdated" and that the current consumer culture (late 1990s) "characterized by continually evolving audio formats and computer technology" as being the functional obsolescence supported by Packard (Strasser, 1999, p. 278). This is a flawed assessment of obsolescence in the consumer electronics and the ICT industries, as Sterne's work shows.

Sterne builds upon Strasser's history of obsolescence and the two major categories of obsolescence–stylistic and technological.[7] Sterne looks to de Tocqueville's writing[8] about political and civil life in the United States during the early 19th century for when the ideas about technological obsolescence appear in the United States. According to Sterne, de Tocqueville observed that US society was based in "continual change" and ideas of "progress" and thus, "tech obsolescence represent[ed] genuine innovation, utility, and to some degree, necessity" (Sterne, 2007, p. 21). But as Sterne observes, the logic of planned obsolescence is different for computers.

Sterne's investigation looks to the discourse of new media and medium studies and explores why calling new media "new" contributes to obsolescence: because "new media technologies … are defined by their own future decomposition" (Sterne, 2007, p. 17). Referencing Leo Marx, Sterne notes that it is "the perception of their disposability that is so novel and interesting" (2007, p. 18) and defines newness in medium studies–something is new in relation to other media. But increasingly new technology references itself–for example, a new smartphone is not akin to television's innovation of a visual radio (Kovarik, 2015); it's just another smartphone with a different set of features and

[7] Micklethwaite (2015) identifies four modes of obsolescence: economic (cost in money and/or labor to repair), aesthetic ("we simply tire of them"), social (not needed anymore), and technological ("we are seduced by newer replacements with more-desired features") (Micklethwaite, 2015, p. 29).
[8] ("Democracy in America," 2016)

functions. Sterne notes that "microcomputers are 40 years old" and despite 40 years of development, the medium has "not yet stabilized" with the goal being to build a staple format and product, like television.[9] Moore's law is the "occupational ideology of computer engineering" (Sterne, 2007, p. 19). Sterne further clarifies this by noting that Moore's law is "canonized as a law" but it is more an "imperative than a law." The industry "does not want the medium to be stable" (Sterne, 2007, p. 20). As CNET reporter Rubin noted, Moore's law is "a force of will, perhaps an addiction, driven by a capitalist intent that has flooded the world with electronics" (B. F. Rubin, 2015).

Braverman's (1998) work on the role that technology plays in the dynamics of capitalism,[10] particularly in the exploitation of labor and the 20th century rise of scientific management in extracting/exploiting labor (Taylorlism), reminds us that Sterne's observations about the social forces involved in obsolescence can go further back than the micro-computer. Braverman argued that there were two approaches to studying technology (and machinery): 1) engineering–focusing on the "technical fact[s]" and defining a technology/machine "in relation to itself"; 2) social–"which views technology in its connections with humanity and defines the machine in relations to human labor, and as a social artifact" (Braverman, 1998, p. 127). The story of e-waste must also address the impact of those social forces on the technical design of consumer electronics. Stern invokes Illich's concept of "radical monopoly," which "is a monopoly of technological form, as opposed to the domination of a market by a single company" (Sterne, 2007, p.

[9] The first computer with a monitor and keyboard was the Digital Equipment PDP-1 from 1960 (Sterne, 2007, p. 19).

[10] Braverman discusses that the significance of the Jacquard weaving machine combined with a knitting machine that used perforated cards for its controls, which introduced "numerical control" to controlling machine tools "a prime instance of the managerial use of machinery in the capitalist mode of production, and how this affects the worker and the labor process" (Braverman, 1998, p. 135). In other words, the Jacquard loom combination was the prototype for punch cards and thus in some respect, data driven, digital communication and capitalism.

24). Woyke's (2014) extensive critical investigation of the smartphone industry offers some insights into the impact of this type of monopoly on the form (and functionality) of smartphones.

Sterne discusses that "obsolescence and durability are first and foremost socially imposed categories" (Sterne, 2007, p. 23). These categories are "vague," and many items classified as obsolete may "function perfectly well" (p. 25). This contributes to the "spatial problem" of ICT obsolescence, whereby there is a "lingering belief in value," either economic or metaphorical. This is a big reason why consumers hold onto devices for so long, which reduces their reusability. Storing the socially categorized as obsolete but still physically functioning devices is a problem because the devices can quickly pass into waste, not just obsolescence (with the social defined obsolete category). The social relations are as important as the physical or technical decay. "People choose to make an object obsolete or they choose to sustain an object long after it would have begun to fall apart on their own" (Sterne, 2007, p. 22). The socially imposed categories of obsolescence are important for determining what is and what is not e-waste. Stakeholders and actors have different definitions–for example, what is defined as e-waste is a contested definition for export policies and international laws (Burrell, 2012; Fonseca & Matielo, 2009; Vallauri, 2009).

Sterne's (2007) comprehensive historical account of different types of obsolescence notes critically that object "obsolescence is not only planned but also forced or engineered" by groups of people (p. 22). The sales effect and continued consumption driven by the forces of capitalism are the backdrop to these decisions and plans. As Sterne critically notes, "from an industry perspective, the real fear must lie in the

manufacturing of a computer that is finally 'good enough'" (Sterne, 2007, p. 28). The concept of *good enough* is an on-going issue with consumer electronics–that a product or feature is fine for the majority of users (Dawson, 2016).

Clearly obsolescence is not just about when product fails or breaks. It is also not just about how someone defines whether or not their phone is obsolete (either due to fashion, features, compatibility, or a broken yet possibly fixable element). Miles, Cawson, and Haddon (1992) show that "product development is a political task" and articulate a process of product development that generates support from a variety of "sociotechnical constituencies" (p. 73). These constituencies or stakeholders include employees, funders and investors, peripheral and software suppliers, distributers, regulators, NGOs, industry associations, as well as consumers (Miles et al., 1992, pp. 73–74). It is these "social relations of production" that influence the development, design, and consumption of ICTs (Foster, 2000, p. 12). Furthermore it is these same social relations that block and restrict environmental and social justice in the cycle of production, distribution, and disposal of ICTs.

2.1.3. Eco-Materialist Media Studies

Many scholars have expanded upon Marx and Engel's analysis of the exploitative nature of capitalism. However, as Mansell (2004) notes "new media are infused with power relations that rarely come to light in the vast majority of studies" (p. 98). Yet, while there are increasing calls to critically investigate new media and ICTs, in order to determine the "historical circumstances" of their production and how this influences their consumption, these critiques have been slow to bridge links between the ecological

impacts of ICTs (Orgad, 2007, p. 525).

Maxwell and Miller (2008b) have addressed the failure of media and communications researchers to "to document or even hint at the existence of an ecological dimension to media technologies themselves" (para 4). They advocate for an "eco-materialist perspective" (p. 91), which focuses on "the relation of media technology and environmental decline" and challenges the traditional focus on consciousness (and texts) in media studies (Maxwell & Miller, 2015, pp. 89–90). Chen (2016) notes that the traditional focus of consciousness is part of three areas of blind spots of media studies that critical political economy of communication identifies. These are 1) post-Fordism and "ideology forces" of new technologies, such as immateriality and the mythological discourse of technology as weightless, clean and sublime; 2) focusing on texts instead of infrastructures and the material elements/forces behind the texts; and 3) an "epistemological division between human and nature" where nature is otherized and "not only constructs a human/nature division, but also legitimizes human's domination and exploitation of nature" (p. 125). Maxwell and Miller also argue that media studies must cease using the "media ecology" metaphor, used in media ecology medium studies. They argue that "media ecology" is a harmful subfield which erases the environment through metaphor and supports a "false premise that social processes mirror ecological ones" and most importantly, that the subfield encourages a "dangerous ecological-amnesia" (Maxwell & Miller, 2015, p. 93).[11]

[11] A recent example of the "dangerous ecological-amnesia" is the journal *Information, Communication & Society* special issue about "Protest Communication Ecologies." The editors argue that the metaphor of ecology needs to be reutilized in order to better assess current social movement activities (Mercea, Iannelli, & Loader, 2016).

2.1.4. Circuits of exploitation

Brophy and de Peuter's (2014) work on the "smartphone cybertariat" or the "collective workforce populating the circuit of exploitation that constitutes the mobile [smartphone] commodity" (2014, p. 77) outlines how "extraction, assembly, design, mobile work, support and disassembly" are different locations of exploitation that critical scholars must examine (p. 61). Chen expands these areas by including software engineering and prosumers' digital labor (2016, p. 121). The "circuit of exploitation" model for ecological materialist analysis of ICTs offers a way to explore the variety of elements involved in ICTs while also allowing exploration of the dialectical relationships and dynamics among the parts (Brophy & de Peuter, 2014; Dyer-Witheford, 2015). Chen (2016) offers a "materialist circuit of exploitation" which expands the circuit in order to more explicitly bridge political economy of ICTs and environmental justice (2016, p. 121). This is an important intervention and one that my project will expand upon.

While I thoroughly agree that "semiotic locus of analysis" has restricted critical analysis of the material in media studies (Chen, 2016: 125), I also think that ecological materialism and critical political economy of communications need to account for the texts about the materiality of media infrastructures–which why I'm looking at how e-waste issues were covered by the media. This is important because we need to account for the impact of a commercially based media covering an issue on which their profits are dependent–advertising consumer electronics and the continuation digital 'life style' through consumption (and thus the continuation of the circuit of exploitation of ICTs). This avenue offers links between the political economic underpinnings of the technology news media and looks at the shifts in news coverage as ICT consumption increased

during the early 21st century, contributing to substantial changes in media institutions and journalism.

2.1.5. Critical Media Infrastructures

It is important to include media industries' analysis in examining consumer electronics and e-waste because of the role that original equipment manufactures (OEMs) play in consumer electronics and ICT (CE/ICT) production processes. E-waste issues are about extraction, assembly, and design (physical and software) in addition to the disassembly phase. For example, hardware design for Apple or Hewlett Packard is connected to the reusability of a product *and* the labor needed for disassembly. Critical political economy of communications has a lengthy history of looking at the social relations within media industries as well as media commodities (Wasko, 2015). Media industry studies have focused on cultural production, political economy of firms and media policy, but is expanding to explore the materiality of media infrastructures, following Acland's call for scholarship to return to Innis's ideas about "dirt research" which provides deeper investigations into the "foundational resource requirements and implications of the production and distribution of media works" (Acland, 2014).

The edited collection *Signal Traffic* outlines that a focus on media infrastructures expands critical scholarship by (a) looking at the distribution processes –the physical systems like sea cables or server farms and the "standards and formats" for content routing; (b) deepening material analysis of media infrastructures by "understand[ing] the materialities of things, sites, people, and processes that locate materialities of media distribution within systems of power"; and (c) critically assessing the relationships

between “technological literacies and public involvement in infrastructure development, regulation, and use” (Parks & Straosielski, 2015, pp. 5–6). My research contributes to critical media infrastructures scholarship by expanding a critical account of the materiality in consumer electronics and hardware for media distribution systems. But, more importantly, this dissertation research works towards expanding Parks and Straosielski’s question, “What would it take to arouse greater public interest in media infrastructures?” (Parks & Straosielski, 2015, p. 6) by assessing a key period in media history, when, for a brief moment, the social and ecological injustice behind the infrastructure of CE/ICT consumption was covered by the media, and thus there was a period of more public interest in media infrastructure issues.

While consumer electronics are traditionally approached as an industry, Acland argues for thinking of the CE industry as an infrastructure, not just an industry–an infrastructure that is tightly bound to the power of the entertainment media industry. Ownership is one way to look at “developing relations among entertainment industries and consumer electronics,” but “the very notion that the connection should be made—that relations among media content and devices should be more elaborately entwined—is the product of concerted intellectual efforts by trade organizations and business leaders” (Acland, 2015, p. 254). Acland’s investigation focuses on trade conferences and summits co-produced by the entertainment and consumer electronics industries between 2000 and 2012. Using Bourdieu’s concept of “position-taking among cultural agents” (p. 257), Acland examines trade publications, press releases, and “paratextual documentation” like convention talk schedules and transcripts, promotional materials, and video presentations from industry gatherings like the annual Consumer Electronics Show (CES), to explore

how “the culturally and industrially dominant position of gear and gadgets is further normalized and settled” at the events, which are “a regularized discursive engine that builds and advocates for an audiovisual infrastructure” (Acland, 2015, p. 264).

2.1.6. CES and Technology Journalism

Acland’s contribution is important to my project because he documents an overview of the history of trade lobby for the electronics industry, the Consumer Electronics Association (CEA) and their annual conference, the Consumer Electronics Show (CES). While first outlining the transition of consumer electronics industries’ integration with the entertainment industry around the turn of the century (1990s–2000s), Acland also reviews the significance of the CES in the early 21st century, focusing particularly on the changes between 2002 and 2012–a similar time period for my research (media coverage between 2002 and 2013). The annual CES was a site of contention for e-waste activists and industry. It was and is a media event when CE/ICT companies could play up their *green* credentials through public relations connected to the conference.

The CEA began in 1924 as the Radio Manufacturers Association. It has changed its name at various time periods to reflect industry trends, moving from a focus on radios and then televisions, Radio-Television Manufactures Association in 1950, to the Radio-Electronics-Television Manufactures Association in 1953, followed by the Electronic Industries Association (EIA) in 1957. A working group of the EIA, the Consumer Electronics Group, changed its name to the Consumer Electronics Manufacturers Association in 1995 and then became the Consumer Electronics Association (CEA) in

1999, leaving the larger EIA[12] organization in 2000 (Harbert, 2007). The CEA changed its name in late 2015 to the Consumer Technology Association (CTA)[13] (Pommer, 2015). The lobbying organization had 600 member companies in 2000, and by 2012, CEA represented 2,000 companies. The organization runs a range of industry conferences and gatherings, but it is best known for the annual CES in Las Vegas.

According to Acland, there were some key moments that hinted at the future relationships between CE manufacturers and the entertainment industry. In 1989, Sony bought Columbia, and in 1991, Panasonic (Matsushita) bought MCA/Universal. Acland notes that business historian Chang has argued that Sony's transition to a media company was due to their loss in VHS/Betamax format battle for video recorders format due to Sony having no content ownership to support its format, Betamax (Acland, 2015, pp. 253–254). Acland's history of the integration of the consumer electronics and entertainment industries emphasizes the social forces involved in technology development. Similar to obsolescence, technology development is not just physics and engineering but a product of decisions. The idea of media convergence is also unpacked by Acland, who says the industry (and academic) claims

> that media were evolving and that their DNA was being gradually modified to facilitate the convergence of all media…Obfuscated in this

[12] The EIA had four remaining groups: "the Electronic Components, Assemblies and Materials Association (ECA); the Government Electronics and Information Technology Association (GEIA); the JEDEC Solid State Technology Association (JEDEC); and the Telecommunications Industry Association. (TIA)." The EIA disbanded in 2007 (Harbert, 2007). The groups have since been combined into other technology industry lobbying organizations. Of these, the TIA and JEDEC operate independently and are heavily involved in design and writing standards for ICT and have extensive policy and lobbying operations (JEDEC Solid State Technology Association, 2006; Telecommunications Industry Association, 2016). Another trade organization that is important to pay attention to is the Information Technology Council (ITI) which is responsible for the Environmental Leadership Council, "the preeminent industry voice for domestic advocacy and compliance assistance in the areas of electronics recycling, environmentally preferable purchasing and materials selection" (Information Technology Industry Council, 2016).

[13] Since this name changed occurred after data collection and analysis for this project, I will continue to refer to the CEA when it is about an event, issue, etc. that occurred before November 2015.

> discourse of the nature life of technological progress were the concrete decisions made to permit such media integration (Acland, 2015, pp. 253–254)

The entertainment industry was not very involved with CEA/CES until 2000-2001. But as Acland notes, the "ascendant logic of convergence helped open the closer movement between content providers, high-tech innovators, and electronics manufacturers" (Acland, 2015, p. 254). Sony was important in the process: It announced the Playstation2 with DVD at CES 2000 and then debuted PlayStation3 with Blu Ray at CES 2006. In 2007, Sony skipped the largest conference for the television industry, the National Association of Television Programming Executives, and instead focused on branding and promotional events at CES in 2007. By 2011, CES had an entertainment subsection started by *Variety*/Penske Media Group and Cricket Wireless, and by 2012 CES began to deemphasize the convention's focus on hardware and devices (Acland, 2015, p. 259).

Unfortunately, Acland's history of CES misses the fact that until 2012, the largest porn industry convention was held at the same time as CES. The integration of the Hollywood entertainment industry was also about the adult entertainment converging with technology as well. The Adult Video News (AVN) Adult Entertainment Expo was a subsection of CES for "adult video" and then became its own convention run during the same time as CES. AVN estimated in 2011 that "a good maybe 40 percent of the fan attendees also attend CES" (Gearlog, 2011). The AVN Expo is now held one week after CES in Las Vegas "to help exhibitors minimize travel expenses and maximize networking opportunities" ("AVN Adult Entertainment Expo," 2016). Though Acland focused on Hollywood blockbuster media properties, the intersection of consumer electronics, media

formats, and the adult entertainment industry is also an important aspect of the larger entertainment consumer electronics infrastructure.

Previous scholarship has explored how the pornography industry's decisions about formats for video and digital media have influenced the larger trajectory of consumer electronics design and media distribution formats (Calcei & M'Chirgui, 2012; Coopersmith, 1998, 2000). Furthermore, as hardware for virtual reality becomes more advanced, the role of the pornography industry in the development of content and technical innovations needs attention. As of 2016, 3 million headsets have been sold globally, and industry estimates for the adoption of devices like the Oculus Rift (a virtual reality headset, now owned by Facebook) are that by 2020, 30 million headsets will be sold globally. According to Dixon, "Porn is listed as a major driving force for VR, although Juniper [Research Group report] points out that most adult entertainment executives believe that significant market share will only come after 2020. What's more, it sees gambling as another big opportunity for VR" (Dixon, 2016, p. 506). While the adult entertainment industry and consumer technology are one area that critical media infrastructures could expand research on, scholarship must also keep attention on broader picture of ICT within almost all consumer products, or what Cisco calls "the Internet of Everything" (Ellen MacArthur Foundation, 2015, p. 25).

Acland's work (2015) also opens up space for an investigation of the relationships of technology news coverage in the development of the entertainment consumer electronics infrastructure. Acland terms "innovation inflation" to describe the fandom and promotional copy embedded in news covering these events like CES, especially within the trade press–"the conventions of trade reporting and promotion require painting

habitually covered issues as though they are fresh and new" (2015, p. 261).

A technology writer, Matt Buchanan, interviewed by Watson (2016), noted that CES during the mid 2000s "was like the fucking Super Bowl. You just needed as many bodies as possible to cover as much of the floor as possible." However he also notes that perhaps the power of CES has waned, saying to Watson that "it is now almost considered a mark of shame to be sent to cover CES" (Watson, 2016, p. 14). Prior to his interview with Watson, Buchanan assessed the importance of CES to the consumer technology industry in a 2013 *Buzzfeed* article. Buchanan's article argues that hardware (and consumer electronics) are no longer where the future is, that the software that runs the electronics is key, and that, increasingly, the makers of the software are manufacturing their own devices. Furthermore, Buchanan argues the physical gatherings of CES and other industry trade events are outdated because "there are now far better ways to tell the story of technology than physical gatherings … The social web has replaced the trade show as a platform for showcasing and distributing products and concepts and ideas" (Buchanan, 2013).

However, despite predicting the end of CES's relevance, Buchanan notes that the space still serves as key conduit for executives, advertisers, and technology journalists.

> But the value in going is increasingly on the sidelines. Advertisers meet media executives; marketing firms pitch clients. For journalists, says *Gizmodo* editor Joe Brown, it's "a bonding experience" for the team and a sourcing opportunity: It's where "you hook up a particularly awesome product manager or engineer with some hand sanitizer or a stick of gum." For Topolsky, "*The Verge* is having a big party. It's a gadget nerd weird tech party."
>
> And while *The Verge* brought 60 people, *Engadget* over 50, *Wired* around 20, and *Gizmodo* brought 16 just for content production, many of the bodies there on behalf of publications are ad people, there to entice brands

> into purchasing ads that'll keep publications running. In part, so they can keep sending people to CES. (Buchanan, 2013)

The above quote supports Acland's assessment of the power of CES in the building and strengthening the "entertainment infrastructure of consumer electronics" (Acland, 2015, p. 254) but also points the technology news industry's symbiotic relationship with CES and the CE/ICT advertising revenue. Furthermore, what Buchanan considers the important focus in 2013 for "emergent new stuff" such as the Oculus Rift VR gaming headset, Pebble Smartwatch and Ouya gaming console,were launched via Kickstarter and social media networks, not at CES. By 2014, automobiles were becoming the focus of attention at CES, which became less about devices and appliances (Garrett, 2014). But it's important to note that all of these products—VR headsets and computer chips for self-driving cars—are still part of the material production of the CE/ICT industry; we just may see less focus on these hardware as software/service becomes the "hot" thing. As Mosco reminds us, it is important to pay attention to when technologies become banal, which is when they recede into the power structure. In reviewing historical patterns of technologies, Mosco notes that the "social impact is greatest when technologies become banal–when they literally (as in the case of electricity) or figuratively withdraw into the woodwork" (Mosco, 2004, p. 19).

While Buchanan's observation of the possible waning influence of CES is notable for his assessment of where new spaces of promotion and networking for CE/ICT infrastructures are happening, CES has expanded in popularity since 2013[14]. While the keynote brands and companies have changed, the show is more popular than ever, with

[14] The attendance at CES decreased following the global recession but the number of companies and products presented continued to increase (Heater, 2010).

attendance in 2016 surpassing previous records, despite CES implementing "enhanced credentialing procedures" (Meyers, 2015). The name change of the largest lobbying organization for CE/ICT from consumer electronics to consumer technology is also reflective of the trends that Buchanan identified in 2013. According to the Consumer Technology Association's press announcements, the shift in focus towards "non-hardware innovators including BMW, Expedia, Ford, Google, Lyft, Netflix, Pandora, Snapchat, Starz, Uber, WebMD, Yelp and Twentieth Century Fox" occurred because the term "electronics" does not "capture the breadth of the consumer tech industry" (Pommer, 2015). But as, *Broadcasting & Cable* noted in their coverage of the name change, the CTA "conveniently avoided the fact that BMW, Ford and others actually do manufacture 'hardware,' although they are increasingly developers and integrators of system and software technology" (Arlen, 2015).

This section has explored ecological materialist media studies, the circuit of exploitation and discussed the role of CES in the infrastructure in ICT/CE. There is a gap in analysis of CE/ICT's circuits of exploitation–the labor of marketing, sales, and persuasion or "the concerted intellectual labor to explain it, interpret it, act upon it, and forecast future prospects" for CE/ICT, which Acland identifies as an essential ideological task for the strengthening of the entertainment CE infrastructure (2015, p. 254). Acland looks to the physical spaces of the industry gatherings for making this labor visible. My project looks at some of the products of that labor and how the narrative of e-waste and environmental injustice was, in many respects, re-shifted back to the ever optimistic encouragement of continual consumption of devices. As Acland notes about the role of the CE/ICT industry media messaging and communication strategies:

> The pursuit is freighted with an ideological task: to make essential the inessential and to conceal the operations of that naturalizing process. This operation is consequential, for it shapes and furthers the platform and device plenitude that marks our time. (Acland, 2015, p. 265)

As CE/ICT continues to retreat into seams of our clothing, coffee makers and cars, it is important that the focus on the materiality of CE/ICT and the circuits of exploitation that produce both hardware and software remain central to media analysis. Critical political economy of communications provides the scaffolding upon which this project approaches some elements of the materiality of CE/ICT–analysis of commodities, obsolescence, and critical media infrastructures studies. It also provides an entry to explore technology news outlets and popular coverage of consumer technologies. These outlets remain understudied, as will be discussed at the end of this chapter, but are an important location of the *naturalizing process* that Acland refers to.

While this study is about electronics recycling and e-waste, critical media infrastructures studies encourages scholarship to focus on exploring the relationships "between technological literacies and public involvement in infrastructure development, regulation, and use." (Parks & Straosielski, 2015, p. 6). When the story of e-waste began to gain traction in various media outlets, the haze of commodity fetishism cleared for brief moment and social relations of exploitation behind the wonders of technology were included in media narratives. But this moment could not last for too long. One of the aims of this research project is to investigate how quickly and which narratives were used to encourage a redirection of attention–away from the exploitation and back towards the future. However, these redirections and reframings are not some sort of backroom conspiracy group directing how news content should shift–they are reflective of

hegemonic processes.

2.1.7. Neoliberal hegemony

Political economists, in examining the social totality of institutions, social relations, commodities and hegemony, have broadly accepted Gramsci's conception of social control analysis (Meehan, Mosco, & Wasko, 1994). Gramsci (1971) clarified ideology as a superstructure, or a system of ideas which are part of the structures and institutions through which material conditions (and domination) manifest and are maintained. Ideology is related to "popular conviction" or that the idea of something has the same or possibly more power than material force (p. 375). Or as Hall (1990) describes, the frameworks for how we "make sense" of the world (Hall, 1990, p. 8). The implications of Gramsci and Hall's arguments are that the media are part of the ideological superstructure through which dominant classes maintain power. The ideas and priorities of the dominant classes seem like common sense, which generates and maintains popular support for their dominance through hegemony. As Hall clarified, ideology, following Gramsci's conceptualization of hegemony, becomes a part of meaning making (through signs, images, discourse and language). Media outlets and coverage as a whole participate in "manufactur[ing] consent" of dominan t messages and meanings of issues and social problems, thus it is important to analyze which messages and meanings not being produced or heard, or "repressed," (Hall, 1982, p. 86).

While hegemony as a concept is applied to a variety of spheres of study, much critical scholarship identifies neoliberalism as a primary hegemonic force in the current era (Couldry, 2010; J. Dean, 2009; Harvey, 2005; Miller, 2008; Schneider, Schwarze,

Bsumek, & Peeples, 2016). As David Harvey said, “neoliberalism has… become incorporated into the common-sense way many of us interpret, live in, and understand the world. ” (Harvey, 2005, p. 3). In general, neoliberalism is “a discourse and set of practices that” prioritizes marketization and free trade, privatization and individualism. (Schneider et al., 2016, p. 4). Part of the hegemonic strength of neoliberalism is its constructionism–“it does not presume the ontological givenness of a thoroughgoing economic rationality for all domains of society but rather takes as its task the development, dissemination, and institutionalization of such a rationality” (Brown, 2003, quoted by Dean, 2009, p. 182).

Neoliberalism’s goal of “weakened state regulation of corporations and industry” as well the emphasis on private, market based solutions has been damaging for environmental and social justice concerns (Melkote & Steeves, 2015, p. 191). A range of interdisciplinary scholarship “argue[s] that neoliberalism has played a significant role [in] limit[ing] progress on environmental issues and policy” and “is largely responsible for governmental inaction on environmental issues” (Schneider et al., 2016, p. 8). This, along with the relationship of neoliberalization “to the logic of capital” and the dominant tendency to “judge all economic activities in terms of profitability, and all social activities in terms of the contribution to capital accumulation” are two key areas that this project explores through examining the changing coverage of e-waste and environmental justice issues (Jessop, 2012, p. 5).

While the exploitative forces of capitalism complement neoliberal philosophy and politics, the role that ICTs play in the expansion of the neoliberal program is also important. Neoliberalism

> requires technologies of information creation and capacities to accumulate, store, transfer, analyse [sic], and use massive databases to guide decisions in the global marketplace. Hence neoliberalism's intense interest in a pursuit of information technologies (Harvey, 2005, p. 3).

Dean's important contribution, which conceptualizes "communicative capitalism," builds upon Harvey's analysis of how the neoliberal project has been strengthened by networked ICTs. Communicative capitalism, or the "convergence of networked telecommunications and globalized neoliberalism" relies on the ideological work of "rhetorics of access, participation, and democracy…to secure the technological infrastructure of neoliberalism" (J. Dean, 2009, pp. 22–23).

The social and environmental impacts of ICT/CE reflect dynamics of an increasingly globalized and interdependent world. Though it may seem that the rapid spread of consumer electronics like mobile phones or even smart jeans has no historical precedent, global development has always been deeply connected to technologies. As Carey (1989) demonstrated with his work on the rise of the telegraph and its relationship the management of people, goods and time, communication technologies have a special place in the mechanisms of capitalism. The relationship of technologies to development interventions globally continues to be explored through the field of international development communication.

2.2. Development and Technology

The following section briefly reviews the history of development communication theories and explores the role that ICTs have played within international development and neoliberal globalization. I investigate scholarship on neoliberal globalization and

development through technology transfer and digital divide issues. I also review discourses and narratives about technology, drawing upon post-colonial and post-development studies about marginalization, exploitation, and absence. The section explores the intersections of technology, neoliberal globalization, and sustainable development and concludes with a discussion about the links between development for social justice, communication rights and environmental justice.

2.2.1. Modernization, Development and Critiques

The modernization or dominant paradigm of development had as its cornerstone the assumptions of positivist-functional accounts of society, which emphasized center (i.e., Western) to peripheral transmissions of culture, technology, and knowledge. The approach also reflected the broader political situation of the Cold War where American politicians assumed that underdeveloped areas of the world were likely to 'turn' communist if they did not develop in the American/Western model. Modernization as development stressed the importance of technology, media systems, and consumption as central processes (Inkeles, 1969; Lerner, 1958; McClelland, 1967; Rostow, 1960; Schramm, 1964). This paradigm and the broader ideological policies of the United States and western liberal capitalism during the second half of 20th century were increasingly challenged by critical theory and global social movements against colonialism, imperialism, and neoliberalism, which critiqued modernization programs for broad systemic failures and long lasting damages to developing countries (Isbister, 2001; Leys, 1996; McDowell, 2003; Melkote & Steeves, 2015; Thussu, 2006).

Two critical perspectives of modernization arose from different parts of the world.

Dependency theory arose from third world and global south scholarship, and cultural imperialism theory arose primarily from scholars in the global north and developed countries. Dependency theory broadly posited that underdevelopment was not accidental nor some innate failing of the people in the third world; countries were underdeveloped as a process of exploitation built on the economic and political legacies of colonialism and imperialism. Key to dependency theory is the concept of core, exploiting countries (developed, global north, western) and peripheral, material resource-providing countries (third world, developing). The other critical perspective on development, cultural imperialism, largely derived in part from political economic critiques of transnational corporate cultural exportations from the global north to south, investigated the potential impacts of the exporting and dumping of cultural products into the third world (Melkote & Steeves, 2001; Thussu, 2006).

Dependency theory was critiqued for its overly material and economic macro account that did not address people's agency (Farraro, 1996, Ibister, 2001). Cultural imperialism was also criticized for failing to account for agency, the role of reception by third world audiences, and a general lack of historical analysis–for example, processes of cultural imperialisms had been occurring for a millennia at least, well before electronic communication. Additionally, the theory was grounded in assumptions of a one way (north to south) flow of cultural products (White, 2001; Sreberny-Mohammadi, 1997). Both of these macro level approaches to development continued to reflect the persistent assumptions of information flow– that of one way flow, linear transmission. So despite offering radically different accounts of what modernization was doing to developing countries, these development theories relied on similar assumptions about the flow of

information that the ‘fathers’ of modernization held.

While the modernization paradigm and subsequent critiques dominated international development research through the 20th century, theorizing about globalization has also become an important area of study. However, theorizing about globalization has suffered from shallow definitions of cultural flows and a continued emphasis on Western perspectives. Debates about whether globalization is the continuation of Modernity, a reflection of the late 20th century economic and political shifts towards neoliberalism, or if the period stems from reactions or determinates of information and communications technologies that crisscross space and the planet still continue. Globalization theorizing also lacked a clear account of the role of media and communications infrastructures while making large assumptions of the role of these technologies as key engines of globalization. The experiences of globalization are extremely mediated, yet early theoretical accounts placed minimal emphasis on mediated processes (Rantanen, 2005).

2.2.2. Discourses of Development

Post-structural critiques of power as discourse have also influenced international communications and development research. Post-structuralism identified discourse as a way of thinking about the construction of meaning within systems of power. Post-development built upon power as discourse to examine how development as a discourse manifests as micro and macro level patterns within development practices and policies (Escobar, 1995; Schech, 2002; Sosale, 2004). A main focus of post-development theorizing are the “colonizing discourses, languages and world views of development

itself" (McGregor, 2009, p. 1695). Additionally, postcolonial theory "worked to destabilize, or at least challenge, the assumption that Western knowledge is objective, authoritative and universally applicable" (W. Anderson, 2011, p. 646). Post-colonial criticism has also been important in challenging images of poverty within development representations. For example, Korte's work on British cultural traditions and colonial representations of poverty, notes that 19th century depictions of poverty in Britain were closely tied to the depictions of British colonial locations:

> Such traditions were significantly shaped by nineteenth-century British cultural production (most prominently from the pen of Charles Dickens), i.e. the representational practice of a society that developed strikingly similar strategies for dealing with its indigent at home and the indigenous people of its colonies. (Korte, 2010, pp. 295–296)

Post-colonial and post-development analysis of development highlights the role of power in representations and how these power dynamics influence and often define what constitutes knowledge and expertise. Escobar's (1995) investigations into technology's role in development discourse and history identified the "moral force" underlying technology discourse in development. Technology in development discourse was "neutral and inevitably beneficial" while programs of technology transfer emphasized the flawed ideals of modernization (Escobar, 1995, p. 36).

Post-colonial scholarship encourages examination of the repressed absences within media coverage in order to help reveal subaltern perspectives and excluded voices. This study of media coverage of e-waste and the environmental justice issues surrounding CE/ICT incorporates post-colonial scholarship's concerns of "location, voice and agency" in media coverage and representations of subaltern and colonized voices (Shome & Hegde, 2002, p. 266). Scholarship about electronic waste and development has recently

begun to address these concerns. For example, Burrell (2016) observed that "the media coverage and the environmental activism that inspired it has … disturbing imagery of abject poverty (something critics have turned to calling poverty porn)" (2016, para. 5). As Cameron and Haanstra discuss, this concept:

> in Foucauldian terms, the pornography of poverty has created a 'regime of truth' about developing countries that mediates relations between the North and South, and helps to reinforce distinctions between 'the west and the rest'. (Cameron & Haanstra, 2008, p. 1478).

The depictions of the Ethiopian Famine of 1984-85 are considered "the high-water mark of the tide of charity images which objectified and dehumanised people in 'Third World' countries, portraying them as helpless, starving, passive victims" (Wilson, 2011, p. 321). However despite more than 30 years of supposed awareness of these problematic, paternalist, neo-colonial, racist and disempowering images and communicative strategies, the *poverty porn* discourse continues to be used by Western NGOs (Randhawa, 2016; Schaffer, 2016).

Shome and Hegde's recommendations for incorporating a post-colonial lens to media analysis challenge communication scholars to not "romanticiz[e] the speech of the colonized as resistant" (p. 266) nor collapse "subaltern lives in an essentialized saga of oppression" (p. 265). Additionally, media analysts should ask, "How is knowledge about 'other' cultures reproduced without affecting the global hegemonic order? How are different national groups represented in depictions of globalization?" (p. 265).

2.2.3. Transnational Globalization and Neoliberalism

Given the variety of ways to describe and use the word globalization, Sklair's

global system theory is useful for identifying the units of analysis when studying globalization. Sklair argues that globalization is not "imperialism in another form" and is different from earlier capitalist eras because 1) the "technological and organizational changes in transnational corporations" (TNCs) and the scale of goods and services produced has changed; 2) the transnational "capitalist class has transformed the ways in which capitalism organizes itself politically;" and 3) "the global scope of TNCs that own and control mass media … transnational advertising agencies, and increasingly the internet" facilitates "a global culture-ideology of consumerism" (2008, p. 215). Globalization can be defined in three ways: Internationalist or state centered; transnational or "globalization as a contested world-historical project with capitalist and other variants"; and globalist: a mostly "irreversible neoliberal capitalist project" (Sklair, 2005, p. 55). Sklair argues for the transnationalist approach, using "transnational practices, forces and institutions" (Sklair, 2008, p. 216) as the unit of analysis because this allows continued focus on state (politicians/policies) mobilization "in the interests of the transnational capitalist class" or "changing role of state actors and agencies in sustaining hegemony of those who drive capitalist [and neoliberal] globalization, that is, the transnational capitalist class" (2005, p. 56).

Sklair's analysis of the transnational capitalist class (TCC) is an important aspect of neoliberalizing processes. According to Sklair, the TCC is comprised of members in corporate, state, technical, and consumerist groups with often overlapping membership whose "economic interests…are globally linked" with "unprecedented mobility of capital." Sklair uses the TCC to identify how the discourses of neoliberal globalization circulate. His breakdown is particularly useful for thinking about the role of experts in

shaping policy discussion and media coverage of transnational issues (like e-waste and environmental and labor polices) and how regardless of national affiliation, "leading personnel in these groups constitute a global power elite, dominant class, or inner circle in the sense that these terms have" in the class and power "structures of specific countries" (Sklair, 2008, p. 217). This connects to the earlier discussion about Acland's (2015) attention to the spaces where the "naturalizing processes" occur within ICT/CE-entertainment infrastructure, often within the networks of the transnational capitalist class. Sklair also notes that one outcome of these political and corporate relationships of the TCC is that "in the sphere of culture-ideology … consumerism is rarely challenged within realistic politics" (Sklair, 2008, p. 217).

The transnationalist approach to capitalist globalization has three areas of analysis: 1) economic practices of transnational corporations, including the relationships and "their cross-border linkages within systems of production and circulation;" 2) political practices of the transnational capitalist class and their processes of "controlling and governing globalization" (P. Dean & Ritzer, 2012, p. 6); and 3) the global culture-ideology of consumerism, which "proclaims, literally, that the meaning of life is found through things" (Sklair, 2005, p. 58). The culture-ideology of consumerism reflects capitalism's "ongoing crisis of overproduction" and deepens crises of "class polarization" and "ecological unsustainability" (Sklair, 2012, p. 2).

As discussed earlier, neoliberalism aims to bring the market to all spheres of life. There are some overlaps between critiques of modernization and market driven approaches to development and neoliberal globalization. In some respects, neoliberal globalization continued the modernization project, but extended its impacts on

developing countries in more extreme and damaging ways once neoliberal ascendency occurred in the late 1970s and 1980s. This era solidified the Washington Consensus and the influence of organizations like the World Bank and International Monetary Fund in the domestic affairs and policies of developing countries, where structural adjustment programs in exchange for loans were used to re-shape investments in countries towards market based, privatized programs rather than national or public infrastructure. The structural adjustment programs also weakened national laws and policies protecting labor, which paved the wave for Special Economic Zones (SEZs), which continue to provide multinational corporations physical locations with limited regulations and protections for labor and the environment (Melkote & Steeves, 2015; Sandoval, 2016). Much of the manufacturing and production of CE/ICTs has benefited from these re-regulated areas– they are "neoliberal territories par excellence where communicative capitalism's ongoing reliance on mass aggregation of industrial labor is manifest" (Brophy & de Peuter, 2014, p. 64). While the neoliberal development agenda of the late 20th century has been a complete disaster for developing countries, the legacy of the disinvestment in public infrastructures and the subsequent neoliberal aftershocks of extreme income inequality and environmental devastation continues (Couldry, 2010; J. Dean, 2009; Harvey, 2005; Jessop, 2012; Melkote & Steeves, 2015; Miller, 2008; Singer, 2010).

2.2.4. ICTs and Development

Neoliberalism also had a significant effect on development perspectives and programs for ICTs. Information flows, communication systems, and technology were key to the underlying assumptions of modernization but also remain central to critiques and

current approaches. The debates about the flow of information came to a political head during the end of the 1970s, particularly with the influence of dependency and cultural imperialism theories and increased empowerment of the third world and nonaligned countries. The macro level approaches to development were reflected at the global level, with the United Nations creating UNESCO at the end of WWII to work on issues of cultural diversity, access to information/communications, and free flow of information. The processes now known as the McBride Commission and the New World Information and Communication Order (NWICO) debates were greatly influenced by the theorizing and assumptions of cultural imperialism and dependency. However, this moment for global policy making that could have potentially changed the negative and exploitative dynamics of development, particularly regarding the role of media and technologies, arose at around the same time that neoliberalism was beginning to influence political structures. The debate about power imbalances and information flows became the free flow of information based on free market principles, reflecting the influence of neoliberal prioritizes as represented by the governments of Ronald Reagan and Margaret Thatcher. The assumptions of neoliberal flows of information are that regulation restricts the free flow of capital (and information) and thus state and local regulations that impinge on the free flow goods and money (and ideas, technologies, and intellectual property) need to be overturned.

International development during this period, as discussed earlier, also reflected the rise of neoliberalism. Media systems, like other infrastructure areas, were targets of structural adjustment and privatization programs that weakened public/nationally run media systems and strengthened commercial (and increasingly concentrated) media

systems (Mansell & Nordenstreng, 2006; Padovani, 2005). Another shift in debates about information flows concerns networks and decentralization (Castells, 2006). Much of these debates hinges on heavy assumptions of technical optimism and the neutrality of technology and theorizing, particularly about the flattening of information production and privileging free market principles (Verdegem, 2011). Modernist technology transfers for developing countries continue to be critiqued for problems with asymmetric information– where knowledge is incentivized in unequal power dynamics and encourages limited movement of knowledge and expertise due to various regulations. Additionally, programs are critiqued for free market prioritization and an emphasis on profit margins which increases costs at local levels as well as increasingly more stringent intellectual property rights claimed by outsiders which increases licensing fees and royalties (Alkhatib, Anis, & Noori, 2008).

The World Summit on the Information Society (WSIS) is reflective of the changes theorizing about information flows and development. While the NWICO debates of the late 1970s and 1980s focused on cultural imperialism and regulations of technology transfers, the WSIS process of the early 21st century reflected the neoliberal hegemony which embraced free market ideology tinged with techno-optimism of the power of technologies to transform poverty and underdevelopment into information and knowledge societies. Whereas during the majority of the 20th century, the debates about the flow of information depended on large assumptions about the linear flow of information, the WSIS highlighted the assumptions of the network flow of information and the power of technologies to transform and create, large and small, effects in the developing world. The WSIS process also highlighted the shift in power and policy

making from the planners and policy wonks to the business world and some degrees of civil society, a concept that was only beginning to develop during the NWICO debates. The rise of civil society and the NGO work on development also reflect the reduced role of state and government power due to neoliberal structural adjustments, both in the developing and developed worlds (Mansell & Nordenstreng, 2006; Padovani, 2005). Finally, a key contribution of WSIS was the elevation of the communication rights discourse, which flows between the "broader human rights discourse and practice and the concept of social justice" (Padovani & Calabrese, 2014b, p. 5). Issues and activism surrounding communications rights reflect intersections between transnational social movements and development for social justice, but also the role that digital inequalities continue to have within development. Despite the shifting debates, the fundamental power structures and relationship of ICTs and development have not changed much, but the possibilities have expanded (Mansell, 2004). There is now an entire subfield of development called ICT4D or ICTs for development.

The prioritized role that ICTs receive in development theory, discourse and practices is the lineage of Lerner's influence on the modernization development paradigm, which prioritized the role that technology played in supposedly accelerating development (Melkote & Steeves, 2015, p. 288). Heeks' (2008) historical review of ICT4D highlights the emphasis that powerful, developed countries have placed on using ICTs to develop administrative and internal operations (bureaucracies) for developing countries, as well as the role that ICTs could play in economic growth. In general, ICT4D refers to all communications technologies, both legacy, analog and broadcast (like television, radio and telephones) as well digital technologies, or "new" ICTs like the

Internet, wired and wireless devices (computers, cell/smart phones,), and satellites (Melkote & Steeves, 2015, pp. 287–288).

Heeks argues that the old paradigm of ICTs for development (ICT4D) is changing to "design[ing] [technologies] around the poor's specific resources, capacities and demands" (p. 32). Heeks sees the new phase of ICT4D as incorporating the shifting trends of mobile technology and increased content production opportunities through the internet. Unwin's (2009) assessment of ICT4D is that there are two different agendas: economic and social. The economic agenda is similar to modernization and free market approaches to development. It aims to expand global ICT consumption but also benefits from maintaining a degree of ICT scarcity as it relates to class and economic power (Verdegem, 2011). The social approach to ICT4D has a "moral agenda" for improving ICT4D so that it is truly for people and not for profiting and reinforcing existing oppressive structures (Unwin, 2009, p. 15). These discussions are consistent with development communication scholarship concerning digital divide and digital inequalities.

2.2.5. Digital Inequalities and Technology Discourse

Digital divide issues have been formally discussed by the United Nations since the mid-1950s. Despite the concern for universal access to communications technologies, there continue to be extreme access gaps between the global north and global south countries. Broadly digital divide issues can be looked at from a basic needs approach–that the focus on ICTs and access is misplaced and more attention is needed on issues like

access to sanitation;[15] a leapfrog or technological fix–that by increasing access to ICTs, other indicators of development will improve; and finally a rights based/social justice approach–that ICTs are an essential right to communication, a basic human right. In 2005, the International Telecommunications Union (ITU) reported that almost one billion people did not have access to a telephone (Thussu, 2006, p. 238). Four years later, the ITU concluded that despite improved ICT access around the world, between 2002 and 2007, rates of digital divides remained almost the same. The ITU also noted that there "is a strong link between ICT prices and ICT [access] levels" (2009, p. 72). We can see the effects of this dynamic in the United States, where digital access continues to be an issue, particularly between income levels[16] and in terms of types of access to the internet.[17] Globally, these divisions continue to exist, particularly between global north and global south locations, though there have been some substantial changes overall.[18] Smartphones and types of internet access continues to reflect divides in gender, education and wealth (International Telecommunications Union, 2015b; Martin & Ito, 2015; Melkote & Steeves, 2015; Poushter, 2016).

Despite a variety of global initiatives to improve ICT access, digital divides are not simply improved by increasing the numbers of computers located in a given area or even expanding how many people are online (Melkote & Steeves, 2015). Couldry (2007) notes that digital divides exist between and within nations and that digital divide research must

[15] (Deen, 2013)
[16] At the end of 2010, 95 percent of high income households (above $75,000) were using the internet in some capacity while 57 percent of low-income households (below $30,000) used the internet (Jansen, 2010; Wayne, 2010).
[17] In the United States, in 2011, "less than two thirds of Americans had home broadband access in 2012 and more than one third [were] offline or "less connected" in 2011. (Mossberger, Tolbert, & Hamilton, 2012, p. 2493).
[18] The ITU notes that as of 2015, "over 95 percent" of the world's population is "covered by mobile-cellular networks" and estimates that "over 40 percent" uses the internet. Mobile-cellular subscriptions grew by almost 5 billion between 2005 and 2015 (International Telecommunications Union, 2015b, p. 1).

investigate beyond physical or technical access in order to address social issues such as digital skills, literacy, and opportunities to practice digital skills (p. 388). Gendered power dynamics of access and ICT knowledge production continues to be a huge issue, one that has not changed much with new media (Paramentier & Huyer, 2008).

Digital divides and inequality must also be examined at the corporate policy level, as exemplified by Roose's (2015) investigation of the evolution of Apple's design and marketing strategies being somewhat contingent upon increasing income stratification. Braverman noted that critical analysis of technology "must not simply accept what the designers, owners, and managers of the machines tell us about them…otherwise it will create not a social science but merely a branch of management science" (Braverman, 1998, p. 12). Thus it is important to look beyond what Intel, Apple, Microsoft and other companies say the future of technology is or what they think the needs of a population might be. Stevenson (2009) notes there has been little research on the "digital divide as a problem of contemporary labor conditions" (p. 3). In tracing the neoliberal impact of the discourse of the digital divide, Stevenson positions the discourse of the digital divide and the surrounding neoliberal enclosures of public infrastructures in contrast to the alternative worldviews of free libre open source software (FLOSS) in developing countries. Stevenson's criticism of the key role of companies like Microsoft "in maintaining the dominant policy problem definition" around digital divide policy is instructive when exploring issues surrounding e-waste and computer refurbishment programs; for example, most computer refurbishers have with a partnership with Microsoft, through the Microsoft Authorized Refurbisher (MAR) program (Stevenson, 2009, p. 4).

Finally, the phrase digital divide must itself be critiqued. Kucukaydin and Tisdell's (2008) work on the discourse of the digital divide as a hegemonic process of capitalist legitimization offers both a critical review of the absence of class analysis in technology discourse as well as ideological critique of the class (and classless) assumptions of the digital divide. The term digital divide(s) limits discussion and consideration of the larger structural inequalities while the term digital inequalities implies a whole range of inequalities including issues of literacy, languages, cultural and technical production, and material access to energy supplies (Foulger, 2001). Education researchers Kucukaydin and Tisdell argue that critical scholarship must "reconstruct the ideology and rhetoric of the digital divide by centering its economic-political and ideological aspects and its relation to educational inequities" (2008, p. 3) and highlight Kvasny's (2006) work on digital inequality. While Kvasny's focus is on the United States context, her distinction between the terms is useful for global contexts as well. As discussed above, the discourses, policies and development programs about digital divides tend to focus on "access to computing artifacts" whereas

> digital inequality is concerned with equitable access to the benefits derived from Internet and computer use. Digital inequality does not only reflect disparities in access to ICT; it also reflects ongoing social inequities (Kvasny, 2006, p. 260).

Reflecting these concerns, this dissertation uses the broader, digital inequalities terminology as opposed to digital divide(s).

Research on digital inequalities offers insights in the broader discourses and narratives that surround the development and consumption of technologies–such as Schaefer and Durham's (2007) work on the G4 i-Mac and other scholarship that investigates the discourse and framings of new consumer technologies using documents

like corporate press releases, advertisements, institutional reports, and news and media coverage in order to examine how the narratives of technology and consumerism reflect power relationships of social and material consequence (Fisher, 2010; Kelly, 2009; Kweon, 2000; Rodino-Colocino, 2006; Spigel, 1992; Stevenson, 2009). Livingstone's ideological analysis of the Apple advertisement campaign (Mac vs. PC) discusses how the messaging about the digital lifestyle embedded in popular culture representations obscures the realities of inequality that digital device consumption is contingent upon. As Livingstone notes, this digital "young, hip" lifestyle is often depicted as "not limited by obligation or, seemingly, by finances" which hides "the reality that such a self-directed, flexible lifestyle is commonly riddled with risk, instability, and hyperindividuality, characteristics of post industrialism that are often left out of the 'digital' discourse' (Boltanski & Chiapello, 2005; Fisher, 2010)." (Livingstone, 2011, p. 227). Critical communications researchers have used popular technology media sources like *Wired* (Fisher, 2010; Millar, 1998) and general consumer and news magazines (Kelly, 2009; Kweon, 2000) to explore gendered and neoliberal discourses around technology and consumption. One way to investigate how social forces and media texts influence how communications technologies is through studying the social construction of technology (Hrynyshyn, 2008). Kelly's (2009) work shows how the studies of the social construction of technology and political economic investigations can be linked. Kelly (2009) uses discourse analysis and quantitative content analysis of advertisements and editorials in consumer magazines to explore the framing of computers between the late 1970s and late 1990s, in order to

> investigate how media texts about computer adoption were influenced by macrosocial factors, particularly the agendas of computer manufacturers,

> government and media decision-makers, and how power relationships are in specific, tangible textual characteristics (Kelly, 2009, p. 33).

Mosco's work on the digital sublime is useful in its historical examination of the myths of the "digerati" and the choir of techno-optimists that dominated late 20th century tech industry and media discussions (Mosco, 2004, p. 11). While Mosco uses myths to analyze the stories told about technologies, he notes that his use of "myth is congealed common sense, understood" in the Gramscian sense (Mosco, 2004, p. 29). LeBel reviews the intertwined strands of the digital sublime discourse surrounding new technologies, noting the sublime discourse underpins "the promise of ecological harmony and a future orientation" that surround ICTs (LeBel, 2012, p. 2). The sublime element that Mosco discusses as the myth surrounding technology has been used to investigate how the magical and black box elements of technology can be hidden and maintained. Critical infrastructures studies also looks at how infrastructures are hidden from public discourse, sometimes through rhetorical device and sometimes through narratives.[19]

Technology as religion or religious symbols was seen before the launch of the iPhone, which had a "spiritual aroma" that reinforced the transcendent narrative of consumer devices, especially during the launch of new products, like the touch screen phone (soon called the smartphone). Willkie notes that "before its announcement the iPhone was often referred to as the 'jesus phone' because of all it (supposedly)

[19] The sublime is also being used to assess data visualization due to "the sublime unknowability of Big Data" that reimagines the sublimeness of nature and scale to the processing of data (W. Davies, 2015). Data visualizations "forces us to contemplate the sublime. Not from an ephemeral, spiritual place, but from a very practical, physical dimension, one that uses specific data referring to a specific phenomenon [like] rising temperatures" (McCann, 2014). However Manovich disagrees with these assessments and deems data visualizations as anti-sublime because they aim at "precisely the opposite" of Romantic artists ideas of "phenomena and effects as unrepresentable, as going beyond the limits of human sense and reason." Data viz "map such phenomena into a representation whose scale is comparable to the scales of human perception and cognition" (Manovich, 2008, pp. 6–7).

represented" (Wilkie, 2011, p. 43). Campbell & La Pastina (2010) used a Lexis Nexis news and blog search in combination with a blog search through Technorati and a Google Images search to conduct a discourse analysis of textual and visual references to the "Jesus phone" in order to examine intertexual religious and mythical meanings that framed and promoted consumer technology.

Post-development critiques of the discourses surrounding technology transfer illuminated the inherent bias of the language surrounding tech transfer projects toward discussing technology as neutral and/or benevolent. As Mosco (2004) reviewed, discourses and narratives of technology generally and historically have often included overly optimistic accounts, especially during the beginning periods of new technologies. While critical scholarship of development locates power of these narratives within development organizations and bureaucracies, Mosco also identifies patterns such as the digerati–technology evangelists. These two spheres of tech evangelism and modernist assumptions of technology transfer often overlap, as research on the One Laptop Per Child project has shown. The key persona behind the OLPC, Nicolas Negroponte, was a widely (and self) acknowledged member of the digerati and a techno-optimist (Negroponte, 1996). The project's techno-optimism and deterministic approach sought to improve digital divide issues and affect other social issues in developing countries, but the outcomes of the project were less successful (Melkote & Steeves, 2015).

The pervasiveness of technical optimism and technological determinism reflects the strength of pro-free market discourse around ICTs and obscures deeper questions related to "how technologies will affect society, democracy, and the environment" (Sturken & Thomas, 2004, p. 10). This optimism can also be seen in current scholarship surrounding

ICTs for development, particularly the enthusiastic accounts of "liberation technology" through digital and mobile technologies and social media platforms. As Diamond (2010) describes, liberation technologies are any "form of ICTs that can expand political, social, and economic freedom" (p. 70). But it seems we've heard this before, that ICTs will save the world, especially the developing world. Thus the story of e-waste is all the more bitter (in the technical optimist perspective) because the thing that was supposed to "liberate" people is in fact poisoning them.

There is considerable literature that investigates digital inequalities, the implications for participation within the global economy, and the communicative sphere facilitated by ICTs, though this research tends to not account for the "material environmental impact of media technologies" (Maxwell & Miller, 2008a, p. 333). These material impacts can be connected to digital divide research through studying technology transfers of old technologies intended to improve physical access to ICTs. As noted earlier, the ITU has identified the cost of technology as an important variable in studying ICT access. ITU's emphasis on the cost of technology (both software and hardware) is important to consider in the context of computer refurbishment and electronic waste disposal patterns, delayed dumping and second-hand electronics.

2.2.6. Defining Dumping and Disassembly

As Pellow (2007) clarifies, delayed dumping references charity donations of used computers that are then "dumped" illegally on communities or charity projects that have good intentions to bring technology to help alleviate digital inequalities; but the social infrastructure (and quality of the computers) is such that the "gift" turns out to be a gift of

e-waste rather than technology that works (p. 135). The issues of delayed dumping were illuminated by e-waste activists in late 2005, with the print and video investigative report, *The Digital Dump*. The report explored dumping in Nigeria and drew attention to the irony that Western/wealthy consumers were most likely trying to do the "right" thing by donating their old electronics, but instead the devices like computers hard drives and monitors ended up in the informal e-waste disposal and disassembly sites surrounding Lagos (Puckett et al., 2005). The dumping of electronics in Third World countries is doubly ridiculous, given the years that development agencies and projects sought to link economic growth and success to ICTs. So the disassembly markets serve a dual purpose– increasing access to ITCs for Nigerians but also contributing to toxic disassembly practices that harm health and environment of the communities.

However, it is important to critically examine the narrative of delayed dumping on/to developing countries. *The Digital Dump* report did discuss reuse and repair work in Nigeria (Puckett et al., 2005, pp. 16–20, 29–30), however, as will be examined in the results of this dissertation, these issues were not included in much media coverage. As Burrell's work on the secondhand computer market in Ghana has observed:

> So far, the formulation of the e-waste problem in Ghana by journalists and activists has not accounted for the distinctions Ghanaians themselves draw between what is reusable, what is valuable, and what is truly waste. Furthermore, the role played by Ghanaians as traders and the reasoning they attach to their involvement in this industry is largely excluded from such a depiction. (Burrell, 2012, p. 181)

Vallauri's (2009) work on Kenyan secondhand computers markets links the limited discussion about second-hand and reuse to the range of potential, and locally situated, definitions of product obsolescence and calls for "more diversified perspectives on the use of second-hand electronic products in developing countries" (p. 21). Fonseca's work

on the Brazilian concept of *gambiarra* further shows that the social context of repair and use matters; *gambiarra* refers to:

> all kinds of improvised solutions to concrete problems that appear when one doesn't have access to the proper tools, materials, parts or specific knowledge to perform a given task. It is all about repairing or re-purposing objects that seemed to be of little use but end up acquiring new value out of tacit, applied creativity. I sometimes call it "everyday innovation" (Fonseca, 2015, p. 57).

The activist and later news media investigations of these informal disassembly and disposal sites revealed the mistaken assumptions of the faith that technology can bring more sustainable development, but these same investigations also in many respects, showed limited perspectives about electronics repair and reuse.

2.2.7. Sustainable Development

Despite the range of criticism about the modernization paradigm of development, it still maintains a dominant presence in development scholarship and practice. The same assumptions about the technological fix of technology transfers were also applied to environmental problems through the Green Revolution and even more so once environmental issues began to be addressed by the international community in the 1970s. The modernization approach to sustainability through economic growth encouraged the scientific management of the environment rather than macro and micro level investments and structural changes[20] that can affect environmental and social justice in countries (Melkote & Steeves, 2015).

The 1972 UN conference on Human Environment began the transnational conversion about the "competing interests of protecting the environment and sustainable

[20] For example, improving gender equality and women's education and economic opportunities in developing countries can improve environmental issues (Arora-Jonsson, 2011; Johnsson-Latham, 2007)-

development" (Melkote & Steeves, 2015, p. 222). Fifteen years later, The Brundtland Report, produced by the World Commission for Environment and Development, defined sustainable development[21] through a "pro-economic growth" lens which encouraged sustainable development through economic growth. The Brundtland Report, titled *Our Common Future*, is a key foundational document for development institutions and practitioners, which unfortunately maintains, in many respects, the problematic elements of the modernization paradigm (economic growth, "faith" in technology, and development through consumption (Melkote & Steeves, 2015, p. 222). The Rio "Earth Summit" or the UN Conference on Environment and Development in 1992 solidified the United Nations' commitment to Brundtland style sustainability and endorsed *Agenda 21*, a document that "argued that global environmental problems" were due to "the profligate consumption and production for richer countries, but also recommended more economic growth for all to finance solutions" (Dryzek, 2013, p. 151). The Rio Declaration also clarified links between sustainability and the precautionary principle[22], noting that "the starting point for environmental sustainability is based on protection against 'irreversible environmental damage' even in the absence of 'full scientific certainty'" (quoting the Rio Declaration, Byster & Smith, 2006b, p. 212).

Thirty years after the first UN conference on the environment, in 2002, the World Summit on Sustainable Development happened in Johannesburg. Drysek notes that this conference (at the time the biggest global conference ever) "saw some major

[21] Brundtland defined sustainable development "development which meets the needs of the present without compromising the ability of future generations to meet their own needs" quoted in (Melkote & Steeves, 2015, p. 222).

[22] Without the precautionary principle and particularly within "chemical manufacturing culture, the absence of toxicity data is often taken to be proof of safety" whereas the precautionary principle advocates that "a substance or chemical should be assumed to be hazardous until proven it is safe." (Byster & Smith, 2006b, p. 212).

repositioning in relation to the discourse" of sustainable development. Free trade and globalization were prioritized by richer nations, and third world governments were more vocal about "the severity of their own environmental problems" (Dryzek, 2013, p. 151). But as Dryzek argues, the biggest shift and "most successful discursive repositioning" was the presence of multinational corporations "which confirmed the status of business as a major participant in sustainable development, not a source of problems to be overcome" (Dryzek, 2013, p. 152). Sklair further clarifies the role of transnational corporations in defining sustainable development as strengthening an "emphasis on self-assessment and voluntary codes, but a decisive input into regulation where necessary" (2008, p. 223).

Ten years later (and 20 years after the first Rio "Earth Summit"), Rio+20 UN Conference on Sustainable Development happened in 2012. In addition to extensive discussion but limited actions on climate change, Rio+20 also "renewed political commitment to sustainable development" (Wanner, 2015, p. 37). Three years later, in September 2015, the United Nations General Assembly adopted the 2030 Sustainable Development Goals. The Sustainable Development Goals (SDG) were similar to the Millennium Development Goals (MDG) from 2000- 2015 which focused on eight connected goals aiming to reduce poverty and global inequity.

During the early 21st century, development was linked to the MDGs via CE/ICT in many ways, from the global policy level discussions about internet governance to local projects that sought to use technology to improve education and economic opportunities (Melkote & Steeves, 2015, pp. 290–291). But now the MDG period has ended, and a new era of goals has been laid out by the United Nations:

> We recognize that eradicating poverty in all its forms and dimensions, including extreme poverty, is the greatest global challenge and an

> indispensable requirement for sustainable development…We are resolved to free the human race from the tyranny of poverty and want and to heal and secure our planet…The 17 Sustainable Development Goals and 169 targets…seek to build on the Millennium Development Goals and complete what they did not achieve. They seek to realize the human rights of all and to achieve gender equality and the empowerment of all women and girls. They are integrated and indivisible and balance the three dimensions of sustainable development: the economic, social and environmental.(United Nations General Assembly, 2015, p. 1).

Sustainable development, according to the United Nations, is a combination of "economic growth, social inclusion and environmental protection" (United Nations, 2016). Similar to the MDG period, ICTs are an important component of the SDG policy goals and programs. The International Telecommunication Union is already using "#ICT4SDG," and if early promotional material is any indication, many of the same assumptions and constraints for equitable ICT policy that Melkote and Steeves (2015) review (p. 293-301) seem likely continue (Alexovich, 2015; International Telecommunications Union, 2015a, 2016). Indian legal scholar Chowdhury has critically noted that, "although the SDGs cover an entire spectrum of environmental goals, the emphasis seems to be on cleaning up pollution rather than on prevention" (2016, p. 84).

The WHO's 2017 report, *Inheriting A Sustainable World? Atlas On Children's Health And The Environment*, discusses global children's' health under the SDG framework and links e-waste disassembly to SDG #6 "clean water and sanitation" and SDG #12 "responsible consumption and production" (World Health Organization, 2017, p. 65). But it is unclear how the social and environmental injustice embedded in CE/ICT infrastructures will be addressed. For example, a report by Columbia University, Ericsson, and the International Telecommunications Union titled *How Information and Communications Technology Can Accelerate Action on the Sustainable Development*

Goals is focused on how to use ICTs to achieve the SDGs and lists "electronic waste, energy performance and carbon emissions" as concerns but directs readers to solutions offered by the World Economic Forum, which focuses on "the circular economy" (Sachs et al., 2016, p. 90). While elements of the circular economy industrial model have some "truly transformative frameworks" (Kopnina, 2015, p. 7), further research is needed on the Sustainable Development Goals and environmental justice within CE/ICT infrastructures.

2.2.8. Development for Social Justice

Given the history of the flawed, top-down Green Revolution and technology transfer as part of development (van de Fliert, 2014) and the "neo-modernization" of sustainable development (Miller, 2014, p. 33), what role does social justice play within development? As Melkote and Steeves note, social justice is a concept that is being applied more frequently in development communication. Their definition of development as "a process of directed change with the establishment of social justice as its objective" moves scholarship and practice towards clarifying the normative aims of development projects (2015, p. 65) as well as challenging the "neoliberal logic [which] guides assumptions about how to engage in social change through the development industry" (Wilkins, 2014, p. 60). Melkote and Steeves's (2015) conceptualization of social justice for development support communication is an important intervention, one that needs expansion by development communication, ecological materialist media studies, and social movement researchers, especially given the role that communication technologies and programs will play within the SGDs over the next fifteen years.

In Melkote and Steeves's (2015) review of actions that development communication for social justice can work towards, social mobilizations and social movements are discussed as important sites. The review of "environmentalist challenges to sustainable development" would be strengthened by including indigenous environmental activism and world views–especially given Melkote and Steeves's inclusion of spirituality in development communication (p. 224-227). Indigenous environmental movements are "asserting … their deep connection to a specific eco-system; revitalizing older epistemologies and cosmologies tied to their relationship to the earth" through mining justice movements and the "emergence of a global indigenous movement" (Kidd, 2016, p. 4). Mining justice activism is also an area that eco-materialist media studies research must direct attention towards as it is a significant site of struggle in the circuit of exploitation processes of CE/ICT–for example, in struggles over gold (Bartlett, 2016) and colbat (Frankel, 2016) mining. It is also a vibrant and surprisingly successful (and dangerous) area of global social justice activism[23] that is challenging neoliberal development projects and "a neo-colonial nexus" of resource extraction (Kidd, 2016, p. 4).

Wilkins's (2014) work on advocacy communication works well with Melkote and Steeves's social justice framework for development communication. Melkote and Steeves categorize social justice processes broadly in terms of "freedom from" and "freedom to" whereby outcomes could occur at macro and micro levels (p. 456). Wilkins notes that "what a social justice framework offers, where other development paradigms have failed,

[23] Mining justice activism reflects "the complex local, national and transnational alliances of indigenous peoples, rural farmers, environmentalists, human rights activists, labor organizations, faith groups and citizens, utilize a very wide repertoire of tactics and organizing approaches, from direct action targeting specific sites and/or companies, to legal and legislative reform at all levels, to creative interventions at multi-lateral forums, and in all forms of mediated communications" (Kidd, 2016, p. 1).

is in its recognition of unjust power structures and resistance to hegemonic elites" (Wilkins, 2014, p. 61). Advocacy communication–defined as lobbying, "raising awareness", expanding constituencies and "influenc[ing] policies"–is one of eight "principle communicative actions" within Melkote and Steeves's framework (p. 457). Wilkins's conceptualization of advocacy as communication is broader and could be found in all eight of the communicative actions that Melkote and Steeves outline, though Wilkins says changing policy is "the ultimate goal of advocacy work" (Wilkins, 2014, p. 66). Advocacy as communication

> can be used to discover, understand, and encourage recognition of problems, as well as of potential solutions, for those engaged in the collective effort as well as for those targeted, such as public constituencies or policymakers. In addition to educating and mobilizing, communication sites serve as a venue through which groups contest interpretations of problems and proposed solutions. (Wilkins, 2014, p. 64)

Advocacy communication figured extensively in the media coverage of e-waste. It was, as Edge's (2011) research showed, primarily a policy and messaging battle and less a social movement mobilization. The e-waste activist network drew from a variety of transnational social movement networks, which "are of particular interest to advocacy communication given their global orientation" (Wilkins, 2014, pp. 66–67).

Melkote and Steeves outline that the outcomes of development communication for social justice are "creating/expanding/sustaining individual and group agency" and "increasing countervailing power of victims of unequal development" (2015, p. 66). Wilkins also emphasizes that within social justice and communication, "agency … is called for to resist dominant rhetorical frames as well as attempt to support redistributive justice in the allocation of material goods." (Wilkins, 2014, p. 62).

These concerns are inspired by post-colonial interventions in development

communication. Agency "in the modernist arrangement of things," as Shome and Hedge remind us, is "taken for granted" (Shome & Hegde, 2002, p. 266). The role of agency and victimhood within coverage of e-waste issues is an important area that will be explored in the results. Given the role that people played in the depictions of e-waste disassembly, labor, and dumping sites, there was surprising little attention given to the people most affected by their labor and the pollution. There was also little attention to the structural context of poverty and the role of ICTs as a marker of development and participation in the economy.

This section has reviewed development communication, ICTs and critical analysis of the modernization and neoliberal approaches to development and globalization. Post-colonial and post-development critiques of the discourses and representations of development and technology were also reviewed, as was the political-economic context of digital inequalities and ICT4D. The section also examined how the modernization paradigm, transnational neoliberal globalization and ICTs connect with sustainable development and finally closed with a discussion of development for social justice and advocacy communication. The next section continues to explore the connections between sustainability and neoliberal globalization through looking at ecological modernization, and sustainable consumerist capitalism.

2.3. Environmental Sociology

In this section, I first review Anthropocene and then briefly review sociological debates between realism and constructionism and the broad paradigms and divisions of environmental sociology. I link this to my previous discussion of ecological materialist

media studies and highlight overlaps between eco-materialist media studies and ecological Marxism. I explore critical views on ecological modernization and look the relationships among e-waste certification programs and sustainable capitalism. I connect this section to neoliberal hegemony and the political economy of CE/ICTs.

2.3.1. Anthropocene

Anthropocene or "New Human" refers to the geological epoch[24] that began after the Industrial Revolution and reflects the impact of humanity as "the main driver of rapid changes in the earth system". Anthropocene era environmental problems are nine planetary boundaries related to three categories of environmental problems. First, measurable changes in levels, which have tipping points that "threaten to destabilize the planet" like levels of global warming (climate change), ocean acidification and ozone depletion. Second, boundaries that "signify the onset of irreversible environmental degradation"–nitrogen/phosphorus cycles, freshwater use, changes in land use (like mining or mineral extraction), and biodiversity and ecosystem loss and extinctions. The third category are measures of which we do "not yet have adequate physical measures" like measuring atmospheric aerosol loading and chemical pollution (Foster, Clark, & York, 2010, pp. 13–14). An example of just one of the boundaries–biodiversity loss and extinction–was addressed by the World Wide Fund for Nature and their *Living Planet Report 2016*, which warned that by 2020, "vertebrate populations may have declined by

[24] While "the term "Anthropocene" is currently used informally to encompass different geological, ecological, sociological, and anthropological changes in recent Earth history, recent geology research has determined that "the Anthropocene stands alone stratigraphically as a new epoch beginning sometime in the mid–20th century" (Waters et al., 2016).

an average of 67 per cent since 1970" (World Wide Fund for Nature (WWF), 2016, p. 44).

As the name of the geological era implies, the role of humans in these devastating trends is central. As chapter one surveyed, e-waste issues and the CE/ICT industries connect to the planetary boundaries in terms of toxics and chemical pollution, rising carbon dioxide levels, material extraction and depletion, and fresh water use. But, as this chapter has discussed, CE/ICT and the circuits of exploitation that e-waste is part of, are also part of a larger structures neoliberal globalization, industrial capitalism, and the culture-ideology of consumerism. The problems of Anthropocene are not simply quantitative measures; they are social structures, patterns and behaviors.

2.3.2. Environment and Society

Environmental sociology has explored issues of the structures and patterns of society and nature for some time. Broadly, environmental sociology sees "environmental problems and solutions as end-products of a dynamic social process of [public & private] definition, negotiation and legitimation" (Hannigan, 1995, p. 31). Environmental scholarship identifies five major moments in environmentalism in the United States 1) a shift towards "romanticism, nationalism, and transcendentalism" views of nature from 1600-1900, this is also when the concept of the sublime understanding of nature and wilderness took hold in literature and art; 2) preservation of nature as wilderness during the 19th century and the early 20th century's movement to protect "natural resources" through conservation; 3) the visibility of pollution (air, water) in the 20th century and the expanding "ecological sensitivity" which brings "the concept of the environmental

commons and a renewed commitment to public health"; 4) the late 1970s and environmental justice grassroots movements beginning to discuss nature not as a separate "place apart from where people work, live, learn, and play"; and 5) sustainability and later climate justice, which "makes connections between social justice and environmental quality from our backyards to our atmosphere" (Cox & Pezzullo, 2016, p. 48).

The broad paradigms of environmental sociology are political economy approaches of ecological modernization and ecological Marxism, world systems and world polity approaches, environmental justice studies, and research on risk, disasters and hazards (David N. Pellow & Brehm, 2013). While the field of environmental sociology is relatively recent within the social sciences (about forty years), reviews of environmental sociology increasingly agree with Foster et. al (2010) and others who have recovered ecological approaches in early social theory of Marx and Weber, challenging the enlightenment assumptions of divide between nature and society (David N. Pellow & Brehm, 2013; Stuart, 2016).

Broadly, the split between society and nature in theoretical frameworks was reflective of realism and constructionism. Critical realists have called for an integration of nature and society, while constructionists have argued that nature/science exists but societies' understanding of it is constructed. Pellow and Brehm define the major features of the field of environmental sociological as 1) "attention to the inseparability of human and non human natures" and 2) "attention to the role that power and social inequality play in shaping human/nonhuman interactions" (David N. Pellow & Brehm, 2013, p. 229).

Foster et. al (2010) further note that environmental sociology is "polarized between two principal approaches": approaches that seek to manage and exploit nature "to conform to the necessities of our production" or ecological modernization; and a range of "radical ecologies that challenge the treadmill of capitalist accumulation" and seek more "ecological sustainability and social equality" (p. 8). Ecological Marxism, environmental justice and ecological materialist media studies follow this second approach.

Earlier this chapter explored ecological materialist media studies, which draws from ecological Marxism, though the lineage is not often specified. Some of the areas that Maxwell and Miller (2012) identify as important to ecological materialist media studies which critical environmental sociology and ecological Marxism have also critiqued: assumptions of the risk society, technological solutions and ecological modernization, corporate social responsibility, and green washing and sustainable/green consumerism. A primary focus of eco-materialist media studies, according to Maxwell and Miller (2015), is "the relation of media technology and environmental decline" and to study "these phenomena in the ecological context in which they arise and operate" (p. 89-90). A way to strengthen ecological materialist media studies would be to incorporate ecological Marxism's conceptualization of "socio-ecological metabolism," (Foster et al., 2010, pp. 46–47). For example, Maxwell and Miller (2015) have called for more cross-disciplinary and activist/scholar work on life-cycle analysis of ICTs (p. 95). Stuart's review of theoretically informed science/social science collaborations notes that "metabolism can serve to bring nature into sociological analysis and provide a model to guide empirical environmental research" (2016, p. 119). Stuart further clarifies, that

> A focus on metabolism can give more attention to nature: it 'is able to account for how capitalism disrupts natural cycles' and represents a promising model to examine nature–society relationships (quoting Clark and York, 2005:418, Stuart, 2016, p. 120)

As discussed in chapter one, life-cycle analysis of ICTs is incredibly complicated and unfortunately, tends towards ecological modernization approaches. Life-cycle analysis becomes useful in order to manage the environmental problem more efficiently or increasingly for OEMs to more efficiently collect/extract resources for continued production, not "to challenge both the ecological degradation and the social exploitation associated with capitalist expansion" (Foster et al., 2010, pp. 46–47). The "focus on metabolism" (Stuart, 2016, p. 120), might offer ecological materialist media studies a way to examine complex systems such as ICT life-cycles in and through their "ecological context" using cross-disciplinary collaborations. Perhaps there will be future work that attempts to link these two critical fields more closely in the effort to bridge the divides of nature/society (sociology) and nature/mind (communication/media studies) that social science and humanities scholarship has tended to reinforce. The remainder of this section examines ecological modernization and sustainable capitalism and reviews two e-waste activist network campaign strategies: e-waste certification programs and green rankings for CE/ICT companies.

2.3.3. Ecological Modernization

In 2009, the United Nations Environment Program (UNEP) released a report investigating the informal and formal sector of electronics recycling in the developing world. The informal sector locations are highly toxic sites where electronic waste is dumped, sorted, and manually dismantled, with the metals collected through open

burning. The report noted that regardless whether the informal recycling was conducted by small pockets of individuals or within more organized, large sites,

> the recycled material or components always directly re-enter the production channels due to the [global] scarcity of the resources containing precious metals. The centralized informal recycling locations are always found adjacent to the electronic and electric production centres. This closed loop recycling chain is following the market rules and is rather flexible towards the grim legislation and management. The incentives of reclaiming more material with lower cost become the main reason for the formation of these large-scale informal sectors in developing countries. (Schluep et al., 2009, p. 54)

The UNEP report spends the bulk of its attention on articulating the potential for various formalization of these recycling centers in the third world. The key press story that followed the release of the report focused on the fact that an increasing source of electronic waste in developing countries was to come from the developing countries themselves, especially in the BRIC nations (Brazil, Russia, India, China) and due to increased access to technologies like mobile phones (Philipson, 2010). However, this narrative is misleading, as the significance of the UNEP report is the policy agenda of ecological modernization, which looks to "how the state can respond to ecological dilemmas" (Schlosberg & Rinfret, 2008, p. 254). Rather than address the insatiable need for expanded profits of the ICT industry, poor product design and business requirements of planned obsolescence or the role of developed nations' contributions to ICT consumption, the UNEP report identifies the developing world as the site of concern. It is also reflective of what Sklair (2007) calls "sustainable global consumerist capitalism" (p. 224) which this chapter section reviews.

Williams, Kahhat, Allenby, Kavazanjian, Kim, and Xu's (2008) ICT life cycle assessment research also identifies that the biggest area of concern, regardless whether

the various policy approaches to e-waste and ICT production succeed, is the growth of ICT consumption and "domestic generation of e-waste" (p. 6452) in the developing world.[25] However, Williams et al. conclude their research with the following caveat:

> We thus argue that societies should explore policies and technology aiming to mitigate environmental impacts while improving social and economic benefits. It may turn out in the end that we are faced with the choice of choosing either environment or economy (p. 6452).

Ecological modernization began as an approach to managing environmental problems. The Brundtland report and the Club of Rome meetings in the 1970s began to link resource depletion to declines in stability and profits. Ecological modernization in many respects mirrored the modernization approach to development– a reliance/faith in technologies' role in solving problems as well as technical solutions–but ecological modernization applied these assumptions to environmental management as opposed to social management (or development). The period of ecological modernization grew during the rise of neoliberal ideological approaches to economic and state policies–a decrease of the role of the state (except in cases which benefit business), privatization of all aspects of life–public and increasingly private spaces; an implicit "faith" in markets to solve social problems. According to Foster, Clark and York:

> the main thrust of environmental social science has shifted to ecological modernization–a managerial approach that sees sustainable technology, sustainable consumption, and market-based solutions (indeed "sustainable capitalism") as providing the answers. (Foster et al., 2010, p. 19)

[25] Williams et. al.(2008) report on the varied research concerning the health impacts of e-waste informal recycling economies, seeking to explore whether "recycling is actually environmental preferable to putting e-waste in sanitary landfills?" (p. 6448). Williams et al. argue that it is not known yet and call for more research "before public policy mandates recycling as the default environmentally preferable alternative" (p. 6448). However, this seemingly cautionary advice does not take away from their findings that also support "increasing body of scientific evidence confirming that the emissions and contamination associated with informal electronics recycling are indeed a serious concern" (p. 6449). Williams et. al. note that while more research is needed, but that "the environmental impact of informal recycling are the most significant of human health impacts associated with the life-cycle of ICT equipment" (p. 6449).

Ecological modernization complemented neoliberal ideology by offering market based opportunities to manage nature more efficiently, while providing opportunities to use (and profit from) technologies to more effectively manage resources. Ecological modernization advocates that capitalism can grow if the environment and natural resources are managed properly. The structural tendencies of capitalism and exploitation of natural resources to increase consumption and profits are not addressed (Brulle, 2010; Foster et al., 2010; David Naguib Pellow, 2007).

2.3.4. E-waste certification

One way of raising awareness and attempting to improve some of the most unjust or environmentally damaging practices behind commodities has been certification programs. The fair trade and anti-sweatshop movement has worked to bring social and ecological justice principles and practices into the supply chains of consumable goods like coffee and clothing. Fair trade certification programs and a range of labeling systems are market based approaches that aim to reveal and improve supply chain processes through harnessing consumer power, corporate social responsibility policies, and discursive struggles over brand images (Bryant & Goodman, 2004; Klein, 1999; Ross, 1997; Stabile, 2000).

In the United States, recycling certification programs and corporate recycling campaigns have become the predominate response to the range of social and environmental justice issues surrounding electronic waste. A key development from the environmental justice organizing of BAN, SVTC and the Electronics Take Back Coalition

(ETBC) is the E-Stewards program, which certifies electronics recycling programs according social and environmental justice principles. This program is one of two certification programs that arose in the absence of national regulations regarding the exportation of electronic waste, but BAN's is considered to be the most progressive and stringent in regards to the disposal practices of e-waste (Gabrys, 2011). For example, while the e-Stewards program does not allow exports of used, non-working electronics to other countries and does not allow incinerations and disposal of electronic waste in landfills, the other program, a combination of two industry developed certifications, Responsible Recycling and the Recycling Industry Operating Standard (R2/RIOS), does permit these practices (Electronics TakeBack Coalition, 2010; Lingelbach, 2008).

There are two main types of programs and operations that participate in certifications programs: for-profit, electronics (and often scrap metal) recycling and refurbishing programs and not-for profit refurbishing and reuse programs. Non-profit programs recycle and refurbish computers and electronics and re-distribute them (either for sale or donation programs). Some of these redistribution programs are located in their local communities like Next Step Recycling in Eugene, Oregon, which emphasizes reusing through refurbishing over simply recycling computers (Next Step Recycling, 2015). Others—like Interconnection in Seattle, Washington—send refurbished computers to developing countries in order to help alleviate digital divides (Interconnection, n.d.). Additionally, community technology centers focused around do-it-yourself (DIY) technology, hacking, computer programming and electronic projects have begun to form in various locations in the United States and Europe. These "hacker spaces" like NoiseBridge in San Francisco, California, refurbish old and outdated technologies for

new uses (Mills, 2009; Tweney, 2009). These spaces and organizations practice refurbishment for a variety of reasons, some of which connect to electronic waste, sustainability, digital inequality and critiques of consumerism. While these hacker spaces are not necessarily clearly linked to environmental justice networks, others, like FreeGeek in Portland, Oregon are directly connected by way of the certification process of the e-Stewards programs (Free Geek, 2016). Popular manifestations of these practices are now seen in DIY technology projects and community spaces. Magazines like *MAKE Magazine* and online content like Instructables.com are also reflective of these trends (Thomas, 2006; Torrey, McDonald, Schilit, & Bly, 2007). These trends increasingly are converging into policy activism around electronics reuse and repair reflected in projects like The Repair Coalition and iFitit.org (Koebler, 2106).

Refurbishing technology, or taking a non-working or outdated model of a computer (or cell phone, electronic gadget, etc.) and fixing it to be re-used is a practice that can be found in all aspects of the ICT global infrastructure. Many of the images and news reports about the dumping of electronic waste in developing countries showed electronic disassemblers and refurbishers, albeit in horribly toxic and polluted conditions, but the people are performing the act of repurposing a product and object into something new, often to generate money. Or as as Van Loon (2002) notes, "with recycling, the idea is that there is more use-value to waste than is currently exploited" (p. 116). These informal and less formal/less regulated sites are an important part of the e-waste global infrastructure (Amoyaw-Osei et al., 2011; Burrell, 2012; Fonseca & Matielo, 2009; Schluep et al., 2009).

Corporate recycling programs have also grown. These are sometimes connected

with certification programs, like Best Buy's "e-cycle" program that uses a combination of e-stewards certified recyclers and noncertified recyclers (BBY Solutions, Inc., 2011). Apple Corporation will recycle consumer products like i-Pods and i-Pads, offering cash reimbursements for working products. Apple says they will "recycle them responsibly" (Apple, Inc., 2017). However, as of 2015, their outsourced recycler, Sims Recycling Solutions is now longer e-Steward certified (Elliott, 2015; e-Stewards.org & BAN, 2015).[26] Additionally, there has been significant growth of the industrial electronics recycling sector, also called urban mining and e-scrap recycling (Daoud, 2011; Interagency Task Force on Electronics Stewardship, 2011). The Institute of Scrap Recycling Industries (ISRI) reported that in 2010 around 3.5 million tons of electronics were recycled and that industry wide revenue was $5.2 billion. However, despite this growth, ISRI notes that majority of recycling comes from institutional or corporate entities while rates of residential electronics recycling are "alarmingly low" (Daoud, 2011, p. 1).

2.3.5. Sustainable capitalism

Certification programs for electronics recycling are a key result of activist organizing for environmental justice but also reflect corporate and industrial responses to these activist challenges (Edge, 2011). There has been minimal scholarly investigation of the networks and linkages between ICT recycling and sustainable production labels and certifications (Renckens, 2008), similar to research done on the forestry industry and the certification of sustainable logging practices (Overdevest, 2005) or fair trade food

[26] In 2016, Apple launched an I-Phone recycling program that uses robots that can "disassemble an iPhone every 11 seconds" (Apple, Inc., 2016, p. 4).

(Goodman, 2004). However, Brockington, Duffy, and Igoe's (2008) analysis of certification processes is useful for investigating the environmental and social relations of ICTs. They note that certification programs, are themselves "a form of fetishization, a symbol stamped on a product guaranteeing its sanctity, but through processes largely invisible and not understood by most consumers" (Brokington et al., 2008, p. 186). These certification process become, in the absence of any state regulation, the sole way to bring some form of attention to bad practices of corporations, while placing the work on the consumers.

Certification and the range of consumer driven programs and labels that result are also reflective of what Sklair (2008) calls "sustainable global consumerist capitalism" (p. 224). Sklair (2008) identifies how sustainable capitalism

> redirects attention away from the discourse of singular ecological crises, a discourse that challenges the very existence of global capitalism, and onto the discourse of multiple environmental challenges that corporations can cope with and global capitalism can live with (p. 224).

Sklair links this concept to Gramsci's historical blocs that reinforce hegemony of the dominant power groups and shows how the concept of sustainable consumerist capitalism successful fulfills this role. Sklair's critique of sustainable consumerist capitalism is similar to Wanner's arguments about the "role of sustainable development in passivizing" the "counter-hegemonic challenge of environmentalism" (Wanner, 2015, p. 27). Sklair's work can be expanded with postcolonial critiques of corporate public relations, which emphasize that an "unregulated global economy ... allows corporations to talk about ecological aims without giving up their determination to concentrate on profit making" (Munshi & Kurian, 2005, p. 514) to highlight how the fetishization of certification

programs combined with "corporate greenwashing" (Beder, 2002) continues to hide away the social and ecological systems that make up technology life cycles.

An example how self-regulation and certifications, publicity and activism are intertwined in corporate sustainability practices is the role of green rankings for corporations. In September 2009, two different environmental ranking reports were published. In one, published by *Newsweek,* Fortune 500 companies were ranked for their "Green" or environmental impact, policies and reputation. Out of the top five companies, four were technology companies, with Hewlett Packard and Dell receiving the number one and two ranking out of the 500 largest US based companies (2009a) (Newsweek, 2009). In the same week, Greenpeace (2009) published their 13th edition of their Greener Electronics report. In this report, Dell and Hewlett Packard did not fare so well. In fact out of 18 companies, Dell and Hewlett Packard were ranked 12 and 15 respectively. While the rating systems are not related in methodologies, and Greenpeace focused on electronics companies worldwide while Newsweek looked only at US based corporations, the disparities in the rankings point to some problematic practices and patterns within the CE/ICT industries and corporate sustainability. Greenpeace emphasized "individual producer responsibility," "precautionary principle" "voluntary take back" programs and "renewable energy" among many other categories of evaluation whereas *Newsweek* relied on published accounts of corporate policies, survey of corporate executives and industry published reports about environmental impact of production and products. Neither of these "green" reports accounted for labor issues involved in ICTs, either at the production or end-of-life cycle of products (Greenpeace, 2009; Newsweek, 2009b).

Another way to describe these trends is the phrase "green capitalism" which

proclaims that "capitalism is not the root of the environmental decline…the real problem stems from poor product and manufacturing design, which leads to huge amounts of wasted natural materials" (Rogers, 2005, p. 212). There are lots of popular constructions of green consumption, for example, the book "*Ecological Intelligence: How Knowing the Hidden Impacts of What We Buy Can Change Everything*" (Goleman, 2009) focuses on the greening of consumerism and increasing ecological awareness of consumers, yet doesn't mention electronics. Another example of greening capitalism, *Climate Capitalism* (Lovins & Cohen, 2011) details how to profit from climate change and presents the business case for sustainable capitalism. The transnational corporation Walmart has an entire book detailing their move to sustainability or "Walmart's green revolution" (Humes, 2011). The amount of products using the "green" label grew extensively between 2005 and 2012, from 1 percent of new products in 2005 to slightly more than 15 percent by 2012 (Cho, 2012, p. 39). As Klein (2014) reports, the shift towards green capitalism via ecological modernization is not just supported by transnational capitalists but has been a concerted project among "Big Green" environmental NGOs, governments and corporations. Sklair notes that:

> corporate environmentalism, therefore, both as a social movement and as a discourse, co-existed easily with [a] moderate conception of sustainability. From this powerful conceptual base big business successfully recruited much of the global environmental movement in the 1990s to the cause of sustainable global consumerist capitalism (Sklair, 2008, p. 224).

Klein's devastating account of the "collusion between big polluters and Big Green" NGOs traces these relationships historically, ideologically, and through policy, funding, and lobbying programs, particularly through issues surrounding climate change and fossil fuels (Klein, 2014, p. 20).

Miller and Maxwell have noted that "from a political-economic perspective, the biggest problems of eco-ethical consumption do not begin at home, and hence cannot be addressed conclusively at that level" (2012, p. 134). Yet somewhat conflictingly, they also advocate that Greenpeace's work on e-waste and CE/ICT toxicity, especially the GreenMyApple campaign against Apple, Inc., reflects "green resistance citizenship" though the campaign was primarily a consumer activism campaign–as a Greenpeace organizer for the campaign describes–a digital campaign that: "encouraged Mac lovers to push Apple to review its recycling policies and use of toxic chemicals" (DeLuca, 2009, p. 266). Maxwell and Miller have also noted that:

> The greening of ICT/CE labor depends in part on such essential structural change. But a deeper transformation will be contingent on the success of activists, researchers, policy makers, and unionists seeking greater transparency in working conditions through the ICT/CE supply chain. For consumers, this transparency can fuel their understanding of electronics worker' experiences China, India, Mexico, and elsewhere – knowledge necessary for cultivating empathy with workers who disappear in the twilight zone of the technological sublime."(Maxwell & Miller, 2012, p. 108)

However, this vision, and their broader proposal of "green citizenship," while laudable, lacks attention to the hegemonic power of sustainable global consumerist capitalism and the ecological modernization paradigm. Their account would be strengthened by more attention to the history and scholarship on social movements and transnational social justice, which the next section of this chapter details.

2.4. Social movements and Media

Many social and environmental justice issues surround the production, use and disposal of electronic devices. But this story is not just about devices, it's also about

people engaged in collective action to challenge unjust practices. The following section examines how social movement theory contributes to understanding how collective action interacts with media systems and how narratives and frames relate to a social justice movements. The section concludes by reviewing research about activist media strategies. e-waste activism and environmental justice.

2.4.1. Social Movement Theory

Tarrow's (2011) account of the lineages of social movement theory traces contentious politics and collective action through critical theory. According to Tarrow, the earliest ideas about collective action are found through Marx and Engels' ideas about class consciousness and the dialectics of struggle. Tarrow also links Lenin's ideas of the vanguard of leadership and organization to the early seeds of resource mobilization theory and the role that strategy and leadership with organizations plays. Gramsci's conceptualization of the hegemonic dynamics of power and the role that culture plays in individual and collective identity also provide foundational theorizing for social movement theory. Additionally, Tarrow traces the rise of new social movement theorizing and cultural accounts of collective action through social psychology's focus on emotion and social construction of frames, cultural studies' attention to identity and agency, and post-structural critiques of power, discourse, resistance, and subjectivity. While the new social movement theories marked a clear departure for theorizing, there increasingly seems to be a consensus that the theoretical tradition can be divided into classical functional accounts–non-rational actor, deviants; structural accounts–resource mobilization/political processes; and social constructionist/cultural accounts–which

include framing, identity movements, and decentralized autonomous movements (D. Della Porta & Tarrow, 2005; D. A Snow, Soule, & Kriesi, 2004; Tarrow, 2011).

Accounts of social movement theory have tended to emphasize organizations and individual participation in collective action through a variety of repertoires of contentious politics. The repertoires include demonstrations, sit-ins, boycotts, civil disobedience, barricades, rebellions, and generalized resistance. However, social movement theory has tended to neglect accounts of how social movements worked with other social movements or how cross movement and cross issue work occurred in an increasingly globalized world (Keck & Sikkink, 1998). Recent historical developments, including the rise of neoliberal ideology and economic expansion of the late 20th century, the collapse of the Soviet Union, and the global expansion of ICTs—which have drastically reduced time and space constraints on communication and mobility—have coincided with a new cycle of protest movements and social uprisings (Ekecrantz, 2011, p. 487). By some accounts these reflect a dramatic departure from social movements of the 20th century (Donatella Della Porta, 2007), but for others, they reflect the historical lineages of transnationalism (Keck & Sikkink, 1998) and networking (Gould, 1995) that have been present, yet under-theorized, in social movement theory.

2.4.2. Transnational Social Justice

Keck & Sikkink's (1998) expansive historical case studies of transnational organizing, strategies, and networks in the abolitionist movements, the suffrage/women's movement, and the environmental and human rights movements revealed the legacy of transnational advocacy networks through the modern era. Advocacy networks are the

processes through which social movement organizations engage with each other across distances of geographical and technological boundaries.

Advocacy, for Keck and Sikkink, is done by people who "plead the causes of others or defend a cause or proposition; they are standins for persons or ideas." Advocacy networks often "involve a small number of activists in a given campaign or advocacy role," and they "are organized to promote causes, principled ideas and norms, and often involve individuals advocating policy changes that cannot be easily linked to their 'interests'" (Keck & Sikkink, 1998, p. 8). Transnational advocacy networks are less about mass mobilization than they are about "pressure and agenda politics" (Keck & Sikkink, 1998, p. 18). Edge's (2011) research conceptualizes the "e-waste network" as such in part due to Keck and Sikkink's work on transnational advocacy networks.

Edge (2011) explores relationships between corporate actors and civil society groups, using the "e-waste network" as one of two cases (the other is anti-GMO food activism). Edge primarily uses literature about global civil society and governance from international relations as well as some social movement research on framing and business "literature on self-regulation and multi-stakeholder certification systems" to investigate the tactics and strategies of civil society groups and the impacts on the vulnerability and/or responsiveness of corporate actors (Edge, 2011, p. 23). According to Edge's dissertation research, the e-waste activists did not engage in a mass mobilization, but used a "two-pronged strategy" of legislative and corporate campaigns. While "the corporate campaign focused on… electronics manufacturers," take-back programs, and sustainable product design, the legislative campaigns "focused on lobbying for the passage of e-waste take-back laws" (Edge, 2011, p. 143). The dissertation used document

analysis and semi-structured interviews conducted in the second half of 2009 with a range of actors from the electronics industry, e-waste activists and transnational environmental NGOs, and regulators from the European Union.

Smith (2008) expanded the conceptualizing of transnational advocacy networks with the ideas of rival transnational networks and complex multilateralism. The concept of rival transnational networks is particularly useful in that Smith offers a clearer picture of the flows and processes of struggle and contention in the dynamics between the democratic globalization network (which also includes the environmental justice networks connected with e-waste activism) and the transnational neoliberal network. The concept of complex multilateralism offers a dynamic, fluid articulation of the variety of leverage points, opportunities, and threats that exist for the democratic globalization network in relationship to neoliberal hegemony. Additionally, this model offers a link between development communication and social movement theorizing as it accounts for the dynamics between various levels and layers of actors in social movement networks and multilateral organizations like the United Nations system (Huesca, 2001).

2.4.3. Social Movement Media

A significant area of concern for social movement researchers and the site of much research is the dynamics between social movements and media (Rauch et al., 2007). This work is quite interdisciplinary and can be found in cultural anthropology, sociology, history, political geography, social psychology, political science, and communications (Mosca, 2014, p. 221). I have drawn on research primarily from communications (political, journalism) and sociology (environmental) in order to

examine the interactions among transnational advocacy networks, social movement media campaigns, and coverage and framing of environmental issues. Defining what media is, like technology, is somewhat contextual within social movement research. Scholarship has tended towards a dichotomous mainstream/alternative approach, with definitions usually continent on funding mechanisms and the mission/values of media institutions (Atton, 2002; Downing, 2001; Mosca, 2014).

Scholars and activists (often both) documented the historical relationships of social movements with autonomous, alternative/independent and radical media (Atton, 2002; Downing, 2001; Halleck, 2002; Kessler, 1984; Rauch, 2016), and other projects have focused on community and citizens media projects (C. Rodríguez, 2001) as well looking at specific types of media, like radio (Coopman, 2008; Howley, 2004; Opel, 2004). Scholarship on the interactions between mainstream media and movements, alternative media, and network concepts–both physical/technological (Dyer-Witheford, 1999) and conceptual–like Sikkink/Keck's transnational advocacy networks began to coalesce following the expansion of the democratic globalization network and activists' use of the internet for networked organizing and media creation, like the Indymedia network (Brooten & Hadl, 2009; Couldry & Curran, 2003; Kidd, 2003; Pickard, 2006). Since the network turn in social movement studies, there has been research that addresses the use of technology by activists to run decentralized communications networks, the use of alternative institutions to challenge mainstream media framing, and the organizational structure and principles of decentralization and open source software (Juris, 2008; Kahn & Kellner, 2007). New scholarship is also grappling with issues surrounding the use of ICTs and social media during anti-war protests, global uprisings about austerity and

inequality (like Occupy in the USA and the May 15th Movements in Spain), revolutions and uprisings in the Middle East, and transnational protests around a variety of issues (Caiani & Borri, 2016; Costanza-Chock, 2012; Cottle & Lester, 2011, 2011; Earl & Kimport, 2011, 2011; Freelon, Lynch, & Aday, 2015; Fuchs, 2011; Tarrow, 2011). Environmental social movements and media constitute almost an entire subfield which will be discussed under the environmental communication section of this chapter.

As Huesca (2001) argued, there has been little overlap between development communication and social movement studies, but this gap shows potential for shrinking as more development communication research and practice applies a social justice framework rather than the overly broad social change[27] approach (Melkote & Steeves, 2015; Wilkins, 2014). A bridge among development communication, transnational advocacy and justice networks, and media is the previously discussed communication rights activism that arose through the WSIS process. These civil society organizations and networks reflect an increasingly a broad range of actors involved in issues related to digital access, transparency, privacy, surveillance, and social media mobilizations, which are all connected to the broader issues of communications rights and media justice (Padovani & Calabrese, 2014a; Clemencia Rodríguez, Kidd, & Stein, 2009).

2.4.4. Framing and Social Movements

While early research tended to focus on mass media coverage, especially newspapers, as "information about the characteristics of protest" during particular time periods or "protest event analysis", scholarship was slow to examine mass media as

[27] Social change lacks the emancipatory operationalization that social justice has–societies can change from democratic to more authoritarian; for example, neoliberalism was a program for social change that minimized equity and justice.

"targets and interlocutors of social movements," seeing media institutions as actors within power systems and social forces that could be acted upon by social movements (Mosca, 2014, p. 222). Institutional approaches to studying mass media and social movements explore "the institutional logics guiding mass media operations and examines how these logics influence the diffusion of movement messages" and have focused on selection and description biases in coverage of social movements through agenda setting, gatekeeping, and framing (Rohlinger & Vaccaro, 2013, p. 1). This is where there is a lot of overlap with communications research, especially political communication and journalism studies.

Agenda setting primarily looks at news and political information and studies the range of debate that audiences have access to and how media "influence the salience of attitudes" (McCombs & Shaw, 1972, p. 177). The agenda setting function of the mass media is generally thought of as constraining the boundaries of media debate but not directing how the audiences think of the issues (McQuail, 2005, 512). Shoemaker's (1991) work on gatekeeping explored how organizational logics drive content selection and processing and how news is molded by social forces like advertisers, markets, interest groups, public relations, and governments. Gatekeeping theory draws from media sociological and production studies of journalistic practices (Tuchman, 1978) and the construction of news through the power that news workers have within coverage decisions.

Framing analysis of social activism has a rich tradition, and the (often) problematic dynamics between the mass media systems and collective action have had a significant impact on the trajectory of social movement mobilizations and social

movement studies (Gamson & Modigliani, 1989; Gamson & Wolfsfeld, 1993; Gitlin, 1980; Rauch et al., 2007; D. A Snow, Rochford, Worden, & Benford, 1986). Gitlin's (1980) comprehensive examination of how corporate media frames contributed to the success and decline of the New Left social movement expanded the use of framing analysis. His classic definition of media frames still helps clarify what media frames are and how the study of framing intersects between many academic traditions. Media frames, according to Gitlin,

> are persistent patterns of cognition, interpretation, and presentation, of selection, emphasis, and exclusion, by which symbol-handlers routinely organize discourse, whether verbal or visual (Gitlin, 1980, p. 7)

Broadly, framing theory has two scholarly foundations: sociological and psychological. Sociological research has focused on frames in news and communication and tends to use content and textual analysis methodologies while psychological research has focused on framing effects on audiences and individuals and tends to use surveys and experiments (Borah, 2011, p. 253). Hardin and Whiteside's (2010) discussion of how framing research has been used by feminist researchers offers an instructive review of D'Angelo's (2002) paradigms of framing research: cognitive (psychological tradition), critical, and constructionist (sociological tradition). The cognitive paradigm focuses more on individual effects of media frames, but "ignore[s] the meaning-making process and sites of resistance" (Hardin & Whiteside, 2010, p. 314). According to Hardin and Whiteside (2010), feminist-framing research uses the constructionist and critical paradigms of framing because these approaches address how power relates to frames. The critical paradigm uses hegemony theory to assess how "frames reflect political, economic and cultural power relations" and considers the production aspects of frames

(p. 314). The constructionist paradigm looks at media makers as not necessarily part of elite, powerful groups but "as information processors who rely on sources they deem credible" (p. 315). Additionally, this approach is not focused on individual media effects but on how frames connect to the viability of social movements (p. 315).

My research uses the critical-constructionist approach to framing, incorporating Hardin & Whiteside's (2010) recommendation to use the constructionist paradigm of framing to "incorporate [e] the realities of a technologically changing media environment [while] offering the 'alternative storylines' that promote social justice" (p. 326). At the same time, this project also uses the critical paradigm of framing to examine the relationships between media frames, hegemonic ideologies and power structures highlighted through political economy. Rauch et. al (2007) do not see the critical and constructionist as two separate (though related) paradigms and instead analyze media framing of social movements using the "critical-constructionist paradigm" where

> journalists are social actors who produce interpretations of the world in cooperation with other people such as sources and newsmakers, some categories of whom enjoy greater access to news producers than others. As they report on novel events, journalists nonetheless use existing templates to guide the assembly of facts, quotations and other elements in a story. This coalescence of social-actor perspectives, reporting routines and discursive structures contributes to an active process of constructing news frames in the form of words and images. (Rauch et al., 2007, p. 133)

Media frames involve the social construction of meaning through economic, political, and cultural power relations (Carragee & Roefs, 2004). Gamson and Wolfsfeld's (1993) classic investigation of the interaction between media and social movements found that "movements need the news media for three major purposes: mobilization, validation, and scope enlargement" (p. 116). As articulated by Snow et al. (1986) frame alignment reflects the process by which collective actors generate frames that resonate

with individuals at a variety of stages in mobilization processes. Frames can be prognostic, antagonist, and consensus building—all ways to address and name grievances while linking grievances to individual values and experiences (David A. Snow, Vliegenthart, & Corrigall-Brown, 2007).

Framing scholarship has also differentiated frames around "emphasis"–either episodic or thematic (Iyengar, 1991). Entman notes that frames "manifest" in texts "by the presence or absence of certain keywords, stock phrases, stereotyped images, sources of information and sentences that provide thematically reinforcing clusters of facts judgments" (Entman, 1993, p. 52). Framing analysis also emphasizes the importance of assessing the sourcing and frame sponsors within news stories as well as media production practices (Borah, 2011; Porto, 2007).

Critical-constructionist framing analysis seeks to understand why and how certain ways of discussing and articulating issues, concepts, and events occur and the power implications behind these "choices" or decisions, which can be unconscious but are often related to other established power structures, like the military or transnational corporations. (Pan & Kosicki, 2001, p. 41). As Carragee and Roefs (2004) note that "frames, as imprints of power, are central to the production of hegemonic meanings" (p. 222). They also criticize trends in framing research that have increasingly failed to account for power and the influence of hegemony on framing (Carragee & Roefs, 2004, p. 222). Frames and discourses are "hegemonic if [they] dominate thinking and [are] translated into institutional arrangements" (Adger, Benjaminsen, Brown, & Svarstad, 2001, p. 685). The exclusion of content (and frames) is as important as inclusion in building and/or maintaining hegemony. This relates to Curran, et. al's (1982) critique that

mainstream media effects research focused on changes but not on the absence of change, nor how dominant values and beliefs can be encouraged through frames.

There are a range of studies concerning media framings of transnational environmental activism around climate change (Eide, Kunelius, & Kumpu, 2010; Mater, 2006; Meadows & Gonzenbach, 2011) as well as studies that investigate the "image politics" of radical environmentalism groups like Greenpeace (DeLuca, 1999). Also of importance for this project is research that examines media coverage of social movement organizing around commodity supply chains like anti-sweatshop movements (Greenberg & Knight, 2004; Guo et al., 2011) and research that has examined media and social movements for democratic globalization (Fiss & Hirsch, 2005; Juris, 2005; Rauch et al., 2007). Swain's (2009) work investigates how environmental justice media coverage frames the moral development of industry. Her research also highlights media frames of the environmental justice movement from 1994–2001 through a quantitative content analysis. Swain used keywords to develop seven frames which were then collapsed into themes of victimization (activism, disparity, and harm frames) and conflict (anger, dispute, problem, and outrage frames) (p.221-222). She also identified stances in media coverage as: pro-industry; anti-industry; pro-environmental justice; anti-environmental justice. Swain suggests using a comparison of press releases and news coverage to examine how industry's positions were used in news coverage (p. 229). Framing studies are also prevalent in the environmental and science communication literature. Nisbet (2009) reviews the role of framing in science communication, which can overlap with environmental communication (for example, the environmental issue of nuclear power is also a scientific discussion). Nisbet builds from Gamson & Modigliani's (1989)

constructivist approach to framing and reviews the eight most common policy frames for scientific and environmental issues–"social progress, economic development, morality/ethics, scientific/technical uncertainty, pandora's box, public accountability/governance, middle way/alternative path, and conflict/strategy" (Nisbet, 2010, p. 46).

One of the challenges of studying social movements and media is that often we are examining the framing processes after the fact and after the events and campaigns that drew media coverage. Scholars analyze the media coverage using a range of approaches to identify the patterns of coverage but there are always assumptions made about the intent of the communication and what the media messaging strategies were intended to be as opposed to what occurred in media coverage. Unless a researcher is working with a social movement or organization before a media campaign begins, it is hard to know afterwards what the activists intended with their framing and messaging strategies. This is also a more general problem with content analysis of news, one that communications researchers have tried to expand through sociological research of news production and organizational studies that investigate what's going on for the journalist, writers, editors, and media workers in their choices to give attention or not to particular frames (Vliegenthart & van Zoonen, 2011).

2.4.5. E-waste Activist Network and Media Strategies

While this research project is not working with the people who designed the messaging strategies for e-waste campaigns, through observation or interviews, it is building from existing research with activists about their considerations of messaging

strategies (a highly intentional process) as well as Edge's (2011) work. Edge conducted a preliminary framing analysis of e-waste issues using interviews with actors from consumer electronics corporations, e-waste activist organizations, and regulators, and an analysis of documents and media coverage in order to assess the frames, audiences, and resonance of e-waste activist campaign messages. The project provides a solid history of the development of the e-waste activist network and the trajectory of corporate policy and regulatory milestones, both in the United States and the European Union. Edge notes that

> The e-waste network has used a variety of collective action frames to bring attention to the e-waste problem and communicate its arguments. The network's frames have been very effective at generating significant media attention and pressuring electronics manufactures and policymakers. The e-waste network's frames have created and widened openings in political and industry opportunity structures worldwide (Edge, 2011, p. 143).

Edge describes "the e-waste network" as

> a global network of activists who have sought to decrease the environmental consequences of e-waste…The network has strong ties to the environmental movement, particularly campaigns advocating for environmental justice and against chemicals and toxic waste (Edge, 2011, p. 167).

I have used the term *e-waste activist network* throughout this dissertation in order to emphasize the activist and advocacy role of the actors and to distinguish from the e-waste sector. Please refer to Appendix B, Codebook for a full description of the organizations I include in this description. Edge's contribution is particularly strong in its documentation of activist and corporate actors' perspectives and reflections on the various phases of the campaigns through late 2009. While the framing analysis is not particularly well operationalized, it did provide an excellent starting point for my research.

In 2006, *Challenging the Chip: Labor Rights and Environnmental Justice in the Global Electronics Industry* was published. The collection included a variety of academic and activist appraisals and evaluations of the environmental justice movement surrounding ICTs (Smith et al., 2006). Articles from the collection are one of the documentary sources for Edge's analysis and for e-waste research generally (S. Chen, 2016; LeBel, 2012; Maxwell & Miller, 2012). Of particular importance for my research is Chad Raphael and Ted Smith's[28] (2006) article from the *Challenging the Chip* collection, which reviews and evaluates the early period of e-waste advocacy strategies, tactics and frames surrounding extended producer responsibility. This article offers a link between wondering what the activists thought they were doing with media framing and what frames became used by the media. The e-waste activists took seriously the idea that "environmental policy struggles are also contests over framing." (p. 253) and built their campaign from previous academic research about environmental framing and media coverage. The activists used Entman's definition of media frames: "a frame identifies social *problems*, names their *causes*, implies a range of *solutions*, and attributes *moral responsibility* by identifying victims, villains, heroes, and heroines" (emphasis original, Raphael & Smith, 2006, p. 253). They also rely on environmental discourse studies–most prominently, Hannigan's 1995 social constructionist account of environmental discourse and five factors for the supposed success or failure of environmental claims. As Raphael and Smith say, focusing on framing for environmental activism campaigns

> turns our attention to which actors possess the power to define problems in the public arena, how they define them strategically, how they use rhetoric

[28] At the time of the article publication, Raphael was on the board of the Silicon Valley Toxics Coalition (SVTC) and Smith was the founder and "former Executive Director, and now Senior Strategists" for the SVTC as well as the "Coordinator [for] the International Campaign for Responsible Technology." (Smith, Sonnenfeld, & Pellow, 2006, p. 340)

> to persuade others to accept their frames, and why some frames are more successful than others. It shows how our definitions of problems often shape the range of reasonable responses to them (Raphael & Smith, 2006, p. 253)

Raphael & Smith (2006) used Hannigan's (1995) factors for environmental claims making to examine the Computer TakeBack Coalition's (CTBC) initial campaign about e-waste and their advocacy for extended producer responsibility, between 2001 and 2004. These factors for frame and claim making success are: authority, cultural consonance, moral drama, urgency and visibility, and an agenda for action (Raphael & Smith, 2006, pp. 253–256). Table 2.1 presents an example of the CTBC's assessments of their framing claims. Additionally, three articles from the same collection: 1) Jim Puckett's[29] article about the creation of the Exporting the Harm report and e-waste dumping in the Guangdong Province of Southern China, 2) David Wood and Robin Schneider's article which reviews the history of the Dell campaign, "ToxicDude.com", and 3) Leslie Byster[30] and Ted Smith's discussion of technology production life cycles and definition of the "triad of sustainability" or "environmental justice, the precautionary principle, and EPR" (p. 211) are also activist source materials that I used in the development of my research project (Byster & Smith, 2006b; Puckett, 2006; Wood & Schneider, 2006).

[29] Jim Puckett was and continues to be the lead coordinator of the Basel Action Network (BAN) (Smith et al., 2006)

[30] Leslie Byster was the "communications and Program Director" of SVTC for over a decade and at the time of the article was a "consultant with the International Campaign for Responsibility Technology" (Smith et al., 2006, p. 349)

Table 2.1 *Examples of e-waste activists' assessments of frames used in the CTBC campaign*

Factor	Claim example
Authority	"Local and state government representatives have been especially important bearers of the message that the cost of handling e-waste are prohibitive and that industry must internalize and reduce them. The movement of bills through state legislatures provided news pegs for ongoing coverage of the e-waste problem."[a]
Cultural consonance	"One tactic has been to discuss EPR as facilitating recycling, which is far more popular than reusing or reducing materials in America's high-consumption society."[a]
Moral drama	The *Exporting the Harm* video and report "captured wide media attention in part because it added human figures to the stage."[b]
Urgency and visibility	"Activists emphasized the problem's urgency by estimating the health and financial costs of handling e-waste over the coming five years."[c]
Agenda for action	"CTBC offered positive publicity from signing the pledge of stewardship and supporting EPR legislation. For the public, the campaign provide its annual environmental report card on electronics companies to help guide purchasing decisions."[c]

Note: Raphael, C., & Smith, T. (2006). Importing extended producer responsibility for electronic equipment into the United States. In T. Smith, D. A. Sonnenfeld, & D. N. Pellow (Eds.), Challenging the chip: Labor rights and environmental justice in the global electronics industry (pp. 247–259). Philadelphia: Temple University Press.
[a] (p. 253).
[b] (p. 254).
[c] (p. 256).

2.4.6. Environmental Justice and E-waste Activism

According to Edge's findings, the e-waste activists' eight frames were: "growing amounts of e-waste, e-waste is toxic waste, mass consumption, individual producer responsibility, environmental justice, prison labor, toxic chemicals in electronics, data security" (p. 156). The media was the target audience for all but one of the eight frames identified. Individual producer responsibility, according to Edge, was targeted towards policy makers and electronics manufacturers. In addition to the media, the e-waste activist network also targeted policymakers, selected electronics manufactures, institutional purchasers and the public with their frames. Edge also notes that environmental justice was the network's master frame which helped "build a collective identity" for the activism which did not have a mass mobilization of supporters. The e-waste activist network is a "single issue network embedded in larger social movements, particularly the environmental movement," and the master frame of environmental justice helped the network "attract a broader range of participants and increased media attention" (Edge, 2011, pp. 256–257).

As detailed by Taylor (2000), social movements' master frames are "crucial ideological frameworks akin to paradigms," and in the case of environmental justice, enables a clear linking of "racism, injustice, and environmentalism in one frame" (p. 514). A key document for the environmental justice movement is the *Principles of Environmental Justice* ("The principles of environmental justice (EJ)," 1991). These 17 principles reflect the major concerns and critiques of environmental justice and were crafted through a lengthy process, which culminated with the First National People of Color Environmental Leadership Summit in 1991. Taylor's ideological framing analysis

of the principles clarifies six major themes from the Principles which reflect the broader theorizing and political commitments of EJ. These themes are "(a) ecological principles; (b) justice and environmental rights; (c) autonomy/self-determination; (d) corporate-community relations; (e) policy, politics, and economic processes; and (f) social movement building" (p. 538-539). Taylor's work further expands the six themes into "minor frames" which constitute the "complex ideological package" or the "environmental justice paradigm" (p. 539). As they are foundational to the broader paradigm of environmental justice and particularly to the e-waste activist network, I have included the document in Appendix C.

In addition to Taylor's scholarship and the EJ principles document, I also drew upon other critical scholarship about international and transnational permeations of environmental justice activism (Anand, 2004; Gandy Jr., 2013; Iles, 2004; David Naguib Pellow, 2007; Roberts, 2007). In addition to the previously discussed activist source materials, I also relied upon e-waste activists' use of the concept of environmental justice in their writings and materials, e.g. Byster and Smith's description of the "triad of sustainability" (2006b, pp. 211–214) as well as Watterson & Chang's discussion of the overlapping struggles for labor rights and environmental justice, who note that:

> two disturbing phenomena are generally found where clusters of electronics manufacturing, assembly, and disassembly operations are located: the generation of serious occupation and environmental hazards for works and nearby communities and the intensification of social inequalities through low wages and labor disempowerment …These are problems of labor rights and environmental injustice (Watterson & Chang, 2006, p. 107)

The activists' accounts of their messaging strategies and campaign reflections (Byster & Smith, 2006a, 2006b; Puckett, 2006; Raphael & Smith, 2006, 2016; Wood & Schneider,

2006) and Edge's (2011) accounts of the e-waste network's framings were used in developing the coding categories and in the document analysis, which I discuss in the next chapter.

This section has reviewed theorizing and research about collective action, social movements, transnational advocacy networks and media. This section works through how this project uses a critical-constructionist perspective on framing and social movements, while also introducing e-waste activists' accounts and reflections on their campaign messaging strategies. While this section has focused primarily on social movement studies, the next section reviews environmental communication literature and examines research concerning media coverage and discourses of climate change, toxics, and risk. The section then looks at visual communication of environmental activism and reviews critical garbage and waste studies, focusing on e-waste art projects, post-colonial analysis of waste and e-waste related research. The section concludes with a discussion of corporate/industry public relations and environmental activism.

2.5. Environmental Communication

Environmental communication has a lengthy tradition within environmental sociology (Adger, Benjaminsen, Brown, & Svarstad, 2001; Castree & Braun, 1998; Dryzek, 2005; Hajer, 1995; Hannigan, 1995; D. E. Taylor, 2000). Scholarship explores rhetoric and the social construction of nature, message construction of environmental policy and advocacy campaigns, representations of nature, science and environmental issues in journalism, advertising and popular culture, and risk communication (Cox & Pezzullo, 2016, pp. 12–15).

2.5.1. Climate Crisis and Toxics

Environmental communication research has used content analysis to examine patterns in coverage of climate change (M. Boykoff, Goodman, & Curtis, 2010; M. T. Boykoff, 2008). Pompper (2004) conducted a longitudinal study of newspaper coverage of environmental risk, specifically the *New York Times*, *USA Today*, and *National Enquirer*, over fifteen years, from 1983–1997, and generated a comprehensive coding process for media depictions of climate change. Chapman, Kumar, Fraser, and Gaber (1997) conducted a comparative examination of environmental media coverage in the United Kingdom and India that highlighted some of the inherent post-colonial tensions embedded in environmental debates.

A transnational comparative research collaboration that examined local and global media coverage in 19 countries of two UN Climate Summits offers some interesting explorations about how to study global news events as well as demonstrates a comparative, multi-method approach (Eide et al., 2010). Using a census of stories about the Climate Summits from an "elite" paper and a "life-world" paper from the 19 countries studied, the researchers conducted a descriptive content analysis of the coverage but also investigated newspaper editorials (published on behalf of the various newspapers, not letters to the editor) for framings of optimist and dystopian views, source patterns, responsibility attribution (who to blame or celebrate), and the extent of local and critical perspective on the global media event (Eide et al., 2010, p. 31).

Scholarship within rhetorical studies of environmental communication has examined nuclear waste storage (Kinsella, 2007; J. A. Peeples, Krannich, & Weiss, 2008), and environmental scholarship has also explored toxics more generally (J. Peeples, 2013).

Since one of the key frames of the e-waste activists was that "e-waste is toxic," understanding some of the implications of the discourse of toxics is important. Pezzulo's (2007) comprehensive ethnographic account of *Toxic Tourism* combines critical analysis of toxics with the role that tours of toxic sites play within the environmental justice movement. She shows how the history of toxics as an issue is focused on individual exposure and personal habits and how these narratives "deflect attention away from broader system causes that are the source of these pollutants" and reinforce the idea of equal responsibility for environmental problems/toxins (Pezzullo, 2007, p. 65). Pezzullo also uses critical document analysis of popular media like women's magazines, films, and comic books to trace the development of toxics discourse as visible and banal but also extraordinary.

2.5.2. Risk and Crisis Communication

Another area of environmental communications is discourse analysis that stems from the risk and crisis theorizing literature. Environmental discourse analysis as described by Hajer (1995) is important because, "the dynamics of environmental politics cannot be understood without taking apart the discursive practices that guide our perception of reality" (p. 17). Lester and Cottle (2009) note the importance of television and the visualization of environmental disasters and crisis in building "ideas of ecological citizenship" (p. 923). Cottle (2009) builds upon Ulrich Beck's work on risk society thesis and calls for more work that examines "the underlying relational and ethical dimension embedded within televised scenes of suffering" (p. 145). His work on the media campaigns of global humanitarian NGOs connects to some of the messaging strategies of

e-waste activists and media portrayals of electronic waste and recycling practitioners–specifically the role of a "regional media emphasis" and the need to localize global problems (p. 145). Cottle also notes the tendency to mediate crisis through

> a national prism that splinters the category of global humanity into 'us' and 'them'... 'active saviours' and 'passive victims' ... this inevitably underplays the active agency of indigenous aid works (and survivors) and reinforces a western-led and western-centric view of humanitarianism (pp. 154–155).

In addition to Cottle's assessment of the active/passive dynamic, this project incorporates include critiques of "compassion fatigue" and "how audiences respond to mediated images of human suffering" (Cottle, 2009, p. 132) as well as Chouliaraki's (2006) work on suffering and spectatorship. Moving research beyond the exploration of how dominant frames and messages serve powerful interests, Cottle proposes that more work needs to be done that examines "how ethical demands become embedded or dissimulated within the communicative forms and appeals of journalism [which] are...profoundly relational and powered" (Cottle, 2009, p. 145).

Risk communication also examines how the precautionary principle is addressed in environmental communication. The precautionary principle increasingly is used by environmental scientists and activists as way to challenge the underlying paradigm of short-term profit gain over considering the longer term human and environmental consequences of products, processes, chemicals, etc. First discussed at the Rio "Earth Summit" in 1992 (the UN Conference on Environment and Development), the precautionary principle "shifts the burden of proof" to corporations, governments, developers, "to show their activity will not cause undue harm to human health or the ecosystem" (Cox & Pezzullo, 2016, p. 127). The precautionary principle is a scientific

approach, a policy goal and a rhetorical strategy that is still in the early stages of being adopted–for example, the EU incorporates more considerations of the precautionary principle in how chemicals are regulated than the United States. The precautionary principle, along with extended producer responsibility and environmental justice, is described by e-waste activists as the "triad of sustainability" which offers "a framework for more enlightened corporate practices and environmental policy, both in the United States and globally" (Byster & Tu, 2006, p. 202).

2.5.3. Visualizing environmental issues

Opel (2007) has examined the potential of environmental documentaries to contribute towards structural change by "reveal[ing] the inner workings of neoliberal globalization" but finds the films suffering from weak conceptual linking of environmental problems to micro and macro cultural and economic shifts and structures (p. 116). Environmental discourse analysis has also investigated narrative films (Murray & Heumann, 2009); environmental stock photos in the Getty Image collection (Hansen & Machin, 2008); Hollywood industries (D. Ingram, 2000); 2000); special effects in nature documentaries (Bagust, 2008), as well as reality TV and the show *Junkyard Wars* (Parks, 2007). DeLuca's (1999) critical rhetorical analysis of broadcast news coverage of Earth First! and Greenpeace image events explores "how radical environmental groups are using image events to attempt both to deconstruct and articulate identities, ideologies, consciousnesses, communities, publics, and cultures in our modern industrial civilization" (DeLuca, 1999, p. 17). DeLuca has continued his work on Greenpeace, interviewing one of the lead organizers on Greenpeace International's toxics campaign.

The organizer details why some of the Greenpeace activism around electronics were successful highlighting the role of parody of corporate branding and consumer/audience involvement in the "GreenMyApple" campaign (DeLuca, 2009, p. 266).

2.5.4. Critical Garbage and Waste Studies

Waste and garbage are studied by many different fields, but can be effectively grouped into five interdisciplinary "critical discourses": 1) urban planning and environmental studies and the impacts of garbage growth and management. The problem of accurate data in studying disposal and waste is a concern for this approach; 2) socio-anthropological approaches which look at "garbage as the product of cultural systems of structuring and signification" and "research on the role of cultural values, symbols, and education in relation to wasting and recycling in everyday life"; 3) artistic projects about and using garbage in art and the ascetics of waste; 4) philosophical approaches which "engage the concept of garbage in relation to cultural and ideology" and offer "critical questioning of the economic, symbolic, and epistemological systems that proceed garbage in its various forms"; and 5) urban studies and geography which explore "spatial garbage" and how urban planning, policies and architecture contribute to garbage and waste systems, and critique the "hegemonic discourses that tend to devalue" sites and systems of garbage (Lindner & Meissner, 2016, pp. 4–5). Critical communications research is interdisciplinary and flows within these areas of garbage studies.

There are a range of artistic projects about and using garbage in art. E-waste in particular has lended itself well to artistic interpretation. Vint and Bould (2009) review the film *Manufacturing Landscapes* (2006), which spent time on e-waste and plays with

the sublime themes of technology and nature. As Vint and Bould describe, the film depicts

> beautiful, snaking piles of cables of various colours that resemble a Jackson Pollock painting, artfully arranged baskets of metals painstaking stripped from discarded circuit boards…juxtaposed with Baichwal's shots of the workers moving through this post-apocalyptic landscape of Information Age detritus or carefully hammering apart mother boards to extract the copper embedded within them. (Vint & Bould, 2009, p. 279).

Vint and Bould's emphasis on the post-apocalyptic scenes and detached observations but not interactions with workers and the imagery of snakes and art of the Baichwal film are themes that e-waste media coverage also relies upon. Miller investigates the role of e-waste art "in broader political terms" and sees e-waste artists as activists whose work "translate[s] scientific and activist ideas" (Miller, 2015, p. 149).

Of particular relevance to my research is Newell's postcolonial analysis of dirt discourse. Using postcolonial discourse analysis of "imperial-era travellers' and traders' journals" and early cleaning product advertising for African markets, Newell explores how the concepts of dirt and cleanliness were part of the colonial project, especially related to consumerism and cleaning products. Newell connects and compares the apocalyptical depictions in Western news coverage of the Ebola outbreak to the histories of colonial discourse about dirt, cleanliness and xenophobia (Newell, 2016, p. 48). Seale's work reconnects to the earlier discussion about the construction of obsolescence and the "paradox of waste" for neoliberalism. She notes that refuse and waste are often discussed as the same, "interchangeable, yet they are different …Waste, through its production and consumption, is reincorporated into an economy. Waste therefore has value, whereas refuse does not, because it is no longer circulating within an economy" (Seale, 2016, p. 70). Seale also identifies the importance of what waste symbolizes–that

waste management systems have failed. Waste is "material manifestation" of this failure and

> the visible proliferation of refuse acts as tocsin warning of unsustainable production and consumption, and resulting environmental degradation. The paradox of waste therefore privileges the symbolism of waste over the materiality of waste. (Seale, 2016, p. 79)

Herbert's work on the political economic connections between Blockbuster Video and Waste Management, Inc. uses critical garbage studies to ground his discussion of waste and media and draws on Mazzolini and Foote's (2012) compilation *Histories of the Dustheap*. The compilation offers a solid review of waste and garbage studies both academic and within the popular press and notes that

> garbage and waste occupy a unique position in how we narrate the keywords that underpin the cultural, social, and political effects and causes of an environmental crisis that brings global and local concerns into a sometimes–discordant conversation (Mazzolini & Foote, 2012, p. 3).

Also included in *Histories of the Dustheap* is Pezzulo's (2012) excellent history of e-waste in Bloomington, Indiana from Westinghouse Electric Corporation's manufacturing facilities. Pezzulo examines the history of PCBs from 1930–2008, through the case of the toxic pollution of Bloomington. Her analysis draws from Leo Marx's work on technology and ideology, reminding "that US culture is indebted to the *myth* that technology will save us from technology" (emphasis original, Pezzullo, 2012, p. 136).

2.5.5. Public relations and the environment

As discussed, the environmental movement shifted in the 1970s, reflecting larger societal changes and political movements. An important aspect of the shift that communications scholarship has identified is the role of the Apollo 8's photos of earth,

which created an "overview effect" through the image that "unexpectedly showed viewers everywhere an image of the earth as a finite resource and helped trigger an awareness of the limits of nature's abundance" (Rogers, 2005, pp. 131–132). This moment, along with a range of environmental and social events, led up to the first Earth Day in April 22, 1970, which is considered "the first popular challenge to America's wasteful production system" (Rogers, 2005, p. 129). However, the industrial resistance to these changes had already begun almost two decades before, when the packaging industry invented litter in order to prevent regulations that would have restricted disposable bottles.

Not littering is often a marker of individual environmental behavior and values, but the concept of litter is actually one of the first successes of corporate environmental public relations. The Keep America Beautiful (KAB) campaign was a concerted effort by industry (a coalition of Coca-Cola, Dixie Cup, Atlantic Richfield, and the National Association of Manufacturers) to shift focus on changing individual behavior and not regulating industry–through the invention of litter. As Rogers' historical account details,

> The centerpiece of the organization's strategy was its great cultural invention: litter. This category of debris existed before, but KAB masterfully transformed its political and cultural meaning to shift the terms of the garbage debate. KAB wanted to turn any stirrings of environmental awareness away from industry's massive and super toxic destruction of the natural world, telescoping ecological disaster down to the eyesore of litter and singling gout the real villain: the notorious "litterbug" … the group could defend disposability and obsolescence (Rogers, 2005, p. 143).

The KAB campaign and the infrastructure of industrial lobbying and public relations it generated laid the groundwork for limited regulations on production. These PR and lobbying infrastructures continued in the pro-recycling era of 1990s and were part of the

range of actors used as industry spokespersons and experts in e-waste media coverage.

The environmental impacts of ICTs were first seriously discussed in 1970s as part of the general corporate public relations discourse about "clean industries" or the supposedly low environmental impact of the ICT industry (Byster & Smith, 2006a, p. 11). The role of public relations campaigns cannot be overemphasized when investigating media coverage of climate change and environmental issues generally. Public relations "has played a highly significant role in the climate change debate and claims-makers are employing increasingly sophisticated strategies to target the media" (A. Anderson, 2009, p. 171). Boykoff's (2008) analysis of conflict and power relations in television and newspaper coverage of climate change emphasizes the power that public opinion and news media have in shaping policy around climate change. Anderson's (2009) investigation highlights the role of conservative think tanks, industry coalitions as news sources, and fake grassroots lobbying organizations like the Global Climate Coalition, which was formed to challenge global warming science.

Within communications research there have been examinations of the role of public relations in environmentalism. Munshi and Kurian (2005) used a post-colonial critique of corporate social responsibility to examine the potential for ethical public relations in dominant oppressive paradigms. Curtin and Rhodenbaugh (2001) discussed agenda setting theory in regards to environmental public relations or the environmental backlash agenda and attempt to refute activists' accounts of greenwashing. Beder (2002) extensively examined greenwashing and corporations' role in environmental public relations/image management, describing how environmental activism can work to improve perceptions but not behavior of corporations. This observation is well suited to

an analysis of media narratives about the consumer electronics industry's responses to the e-waste crisis. Despite over 10 years of media, activist, policy maker and corporate attention to environmental justice issues surrounding consumer electronics (Edge, 2011), the consumer electronics industry continues to "spin a narrative of digital desire and dissatisfaction that ignores the downstream and upstream consequences associated with unsustainable production and consumption of technology and data" (Carli, 2010).

While there is minimal research that looks at the role of public relations campaigns by ICT/CE companies to challenge environmental justice activism, Schneider et al. encourage environmental communication to pay "greater attention to the ideological dimensions of industry rhetoric" (Schneider et al., 2016, p. 3). Focused on the coal industry and climate justice activism around fossil fuels (like coal), Schneider et al. explore how "corporate advocacy" uses "rhetorical strategies" within neoliberalism, noting that "the industry's rhetoric represents one of the most prominent sites where the climate counter-movement in particular and neoliberalism in general struggle to maintain hegemony" (Schneider et al., 2016, p. 7). While their work is focused on coal and the five rhetorical strategies of the coal industry that they identify, Schneider et al. argue that the environmental scholarship should see the coal industry responses and communication strategies as foreshadowing other industrial rhetoric in climate crisis era (Schneider et al., 2016, p. 5). Their research shows "how the industry manages the tensions and contradictions of neoliberalism while serving the aims of stalling regulatory action and marginalizing environmental concerns" (Schneider et al., 2016, p. 6).

Key for my project is Schneider et al.'s assessment of "appropriation in environmental discourse," which expands critiques of public relations and industry

counter communication strategies beyond greenwashing to four areas: “lateral appropriation, greenwashing, astroturfing, and aggressive mimicry” (Schneider et al., 2016, p. 15). Their research on the coal industry shows that rather than traditional greening or greenwashing of their policies and practices, the coal industry increasingly shifts their portrayals as “responsive to, or concerned with, the needs of society”. They further clarify the significance of the appropriation, or “corporate ventriloquism” which “does not hide behind front groups” but instead

> constructs a corporate voice that is positioned as a voice of citizenship, blurring and flattening the distinction between corporation and citizen in ways that advantageous to industry. Corporate ventriloquism is itself foundational to neoliberalization (Schneider et al., 2016, p. 19).

The authors also look at how the coal industry flips the environmental apocalyptic frame/story to one of “industrial apocalyptic”–loss of jobs, of industry in the regions where coal operates (Schneider et al., 2016, p. 18).

Another contribution of Schneider et al. is their assessment of the “hypocrite’s trap” which the coal industry used to deflate/respond to the climate justice and coal divestment movement. This relies on portraying activists as “idealist and unrealistic, elitist and dangerous, and hypocritical and immoral” (Schneider et al., 2016, p. 20). This was seen also in the coverage of e-waste, particularly the lack of realism of activists and the challenge of critiquing an issue through the very systems (like computers, internet, mobiles) that the problem was about. They review the role of the public relations firm Berman & Company whose founder is noted for his PR strategies that “demolish the moral authority” of opponents and aim to create “ambiguity in the public’s mind about the right course of policy action”–what Schnieder et al. call “manufactured confusion …

intended to paralyze decision making". Activists are portrayed as "naïve" and "ignorant of how the world really works" and that they "are complicit in supporting fossil fuel" because they consume products made with fossil fuels, which works to "reinscribe divestment activists not as members of a collective movement but rather as individual consumers" and thus also, "hypocrites" which further works towards "delegitimizing collective action against fossil fuel consumption" (Schneider et al., 2016, p. 107). The authors note that the realist claims "work to subvert serious challenges to the neoliberal common sense about markets, politics, and rhetoric" (p. 121) and that the "hypocrite's trap is designed to economize politics by individualizing responsibility" (Schneider et al., 2016, p. 123)

In addition to looking at industry rhetoric and public relations practices, critical scholarship also looks at the dynamics of public relations within NGOs. As is discussed in the next section, NGOs are increasingly positioned as sources and experts in journalism.

2.6. Journalism: NGOs, Technology and Environmental Coverage

This final section discusses research about NGOs, journalism and public relations. I then examine changes in technology and news consumption and outline a brief history of technology coverage. The chapter closes with a discussion of environmental journalism and relationships between environmental news and news about science and technology. I then present a visual overview of the chapter and review how the chapter supports the research questions.

2.6.1. NGOs and Journalism

Lewis, Williams and Franklin's (2008) study of the depth of public relations in news stories through a content analysis of UK press, broadcast, and radio in 2006 showed "substantive empirical evidence" of extensive reliance on public relations materials and copy (J. Lewis, Williams, & Franklin, 2008, p. 1). Building on Gandy's "information subsidies" concept about the role that public relations practices play within for-profit media systems—that public relations materials and strategies help newsrooms reduce costs by providing a "subsidy" of information, story ideas, source/interview, and audio/visual materials—Lewis et al. also show that business and corporate public relations were much more likely (four times more) than "NGOs or pressure groups to 'place' their PR material into news stories" (J. Lewis et al., 2008, p. 12). The political economic implications of Lewis et al.'s research are that "the drive for profit maximisation [sic] thereby compromises the independence of the press. The line between journalism and PR–between factual reporting and partisan narrative–becomes blurred" (J. Lewis et al., 2008, p. 2). While the research did not look at United States media outlets, the issue of public relations influence in news agendas and source domination is applicable as public relations is global industry and much of the strategies are likely to be the same in the United States. A similar analysis of US news and public relations would be useful.

In some respects, the overreliance on PR material in news stories that Lewis et al. found reflected the rise *churnalism*, a term coined by former journalist, Nick Davis during same time period that this dissertation studies. According to Davis, journalists "are no longer out gathering news but who are reduced instead to passive processors of

whatever material comes their way, churning out stories, whether real event or PR artifice, important or trivial, true or false" (2011, p. 59). Churnalism is a product of trends in ICTs and news media, neoliberal globalization and ICTs–speed, a reliance on public relations agencies, and market prioritization/reduced operating costs for news organizations. It "is the passive processing of material which overwhelmingly tends to be supplied for them by outsiders, particularly wire agencies and PR" (N. Davies, 2011, p. 73). It might seem that these trends of journalists relying upon outside actors to provide ready made stories would benefit NGOs trying to get their issues covered. However, when Bowers (2011) used content analysis of coverage of the 2009 G20 London meeting/protests and interviews with UK-based NGO media relations staff to examine how successful NGOs were at changing representations of non-institutional voices in media coverage of social protest, Bowers found that "the views of institutional sources" were promoted over NGO or "non-institutional" sources, despite the extensive efforts of the NGOs leading up to and during the G20 meeting (Bowers, 2011, p. 126).

The collaborative research project, *New Media, Old News* (Fenton, 2010c) explores the "social history of journalism and news media" by examining "the changes in nature of news and news production over the last two decades – 'globalization of news', increased ownership concentration and technological transformations" (Fenton, 2010a, p. 11). Fenton's work offers some key insights about the relationship of journalism and NGOs/advocacy organizations in the early 21st century which are relevant to my project. NGOs have an increased legitimate "social and political role" due to the neoliberal era's de-emphasis and attack on the state. Credibility has also increased, as NGOs have become "accepted as service providers and as legitimate voices and informed

campaigners on public concerns and political matters." Some NGOs have become "authorized knowers" for journalists due to their increased legitimacy and credibility and "strategic positioning" of "their organization and their issue profile." Finally, to gain mainstream media acceptance, NGOs use a "'public image of neutrality'" which privileges the "ethics of objectivity and impartiality" which are very similar to journalistic ideals. Despite optimistic predictions that expanded publicity would "increase advocacy … new media seems to have amplified the pressure on NGOs to emulate mainstream news, encouraging them to act as pseudo journalists in simulated newsrooms" (Fenton, 2010c, pp. 155–156). Fenton's insights about NGOs as *pseudo journalists* is very appropriate for my investigation as in many cases, the NGOs who comprised the e-waste activist network provided the research and conducted investigations about the issues for the journalists who later (sometimes) did their own follow up investigations but often the reporting consisted of relaying in some new form the original information presented in the e-waste activist reports.

While the organizations may get more coverage, Fenton's investigation found that NGOs were not able to "to change news agendas and challenge normative conceptions of news criteria." What happens is "news-cloning"–where more resourced NGOs become issue "entrepreneurs" and increasingly "follow a 'media logic' that conditions how they behave–how they provide news gatherers with material that conforms to the pre-established criteria of what news is" (2010c, p. 158). NGOs' differing levels of resources and staff affect their involvement in news creation, with some staff having backgrounds in news or public relations, who "perceive themselves as journalists" who "seek to provide ready-made copy to fill the ever expanding space available to news" (2010c, p.

157).

The impact of commercial, for-profit, entertainment focused media means that as NGOs increasingly follow the "media logic they run the very real risk of pandering to the market encouraging, albeit implicitly, the demise of autonomous investigative journalism" (2010c, p. 158). Regardless of size, NGOs "have learnt that they will only get their voices heard if they subscribe to journalistic criteria of expertise and professionalism" (Fenton, 2010c, p. 160). While NGO media knowledge and practice has increased, during the same period the economic constraints on newsrooms have lead to decreased budgets for investigative reporting, especially international reporting. As news outlets lack access and/or funds to cover global stories, NGOs' increasing "role in global politics as adjudicators, translators and mediators" further expands their credibility with news outlets, both as sources and as information subsidy providers (Fenton, 2010c, pp. 160–161). The "consequence" is that

> NGOs target traditionally powerful news outlets with more and more professional adeptness and news know-how, established news values remain as dominant, and one could argue even more entrenched than ever before…the internet may provide constant possibilities for the fracturing of dominant discourses but on the whole these remain unused and untapped (2010c, p. 162).

This relates to e-waste news coverage as activists prioritized cultural consonance as a messaging strategy which focused on fixing specific problems like increasing recycling, but not structural challenges to mass consumption or the contradictions of capitalism and exploitation; these are not normative news format ready (Raphael & Smith, 2006). Furthermore, Fenton's research highlights the "increasing importance [of] the distribution of professionally produced reports on-line and pre-packaged news material that can be downloaded with a single click" (Fenton, 2010c, p. 164). This is also reflective of the e-

waste activists' reports and investigations. Fenton reminds that it is important to remember that the "media centric model" does not account for and "is oblivious" to policy and campaign work, lobbying and organizing (2010c, pp. 166–167).

Though Fenton and the larger Goldsmith University research project is focused on the United Kingdom, as Benson (2010) notes, many of the same structural and technical constraints and realties of media institutions exist within the United States. Furthermore, the e-waste network reflects transnational activism; NGOs like Greenpeace operate in the UK and the USA. The findings of the *New Media, Old News* (Fenton, 2010b) project as a whole are an important contribution that will hopefully be modeled for research on news organizations in the United States and elsewhere, along with assessing the impacts of algorithmic aggregation on news content which have developed since the book was published. Given the continued pressures on commercial based news organizations, *New Media, Old News* argues that

> it seems ever likely that the voices on the web will be dominated by the larger, more established news providers that will duplicate the same commercial interests according to the same understanding of how news fits those commercial concerns (Fenton, 2010a, p. 13).

2.6.2. Digital News and Technology Coverage

The Pew Center's (2010) research into online news consumption demonstrates that "legacy news organizations–especially cable stations[31] and newspapers[32]–dominate the online news space in traffic and loyalty." These legacy media outlets and traditional news brands make up 75% of the top 20 news websites. Many of these top sites are also news aggregators, like Google News. (Pew Research Center, 2010). Additionally,

[31] MSNBC, CNN, FoxNews and ABCNews
[32] NYTimes.com, WashingtonPost.com, USAToday.com

according to the Pew Center, the internet is a more popular news platform than newspapers and radio, with 61% of Americans accessing online news daily. Significantly for academic researchers of news coverage, only 17% of Americans "read news in a national newspaper like the *New York Times* or *USA Today*" (Purcell, Rainie, Mitchell, Rosenstiel, & Olmstead, 2010, p. 3). Pew survey research found that by 2004, "between 42% and 59% of Americans over 18–92 million to 128 million people–had gone online for news at some point" (Project for Excellence in Journalism, 2005). By 2008, more Americans "say they rely mostly on the internet for news than cite newspapers (35%)." (Pew Research Center, 2008). Seven years later, almost 40% of adult Americans, "said that they often get news from digital sources, including news websites or apps (28%) and social networking sites (18%)" as opposed to 20% from print newspapers (Lu & Holcomb, 2016).

According to Nisbet (2010), it is "important to also expand the scope of research and applications beyond the mainstream media to include new interactive forms of digital media" (p. 74 -75). Given that scientific and technological advances contribute to the expansion of the consumer electronic products, how do consumers learn about these advances and technology generally? Critical political economy analysis of news and information sources for consumer electronics offers a glimpse into the concentrated nature of these information sources. For example, the major sources of technology news and "gadget media" (Edge, 2011, p. 167), are primarily owned by four companies - International Data Group (IDG), AOL, Advance Publications, and CBS[33] (Columbia Journalism Review, 2013). Freelon, Merritt, and Jaymes (2015) note that,

[33] For example, International Data Group owns *PCWorld, MacWorld, ZDNet*; AOL owns *TechCrunch* and *Engadget*; Advance Publications owns Condé Nast (*Wired, Reddit, ArsTechnica*); and CBS owns *CNET*. See Table 3.1.

> very little research has yet been conducted on blogs and other online publications that cover the technology industry, especially as compared to the substantial literature on science journalism. The few existing studies on the topic suggest that tech blogs play a major role in shaping both the public's and the industry's attitudes toward digital technologies (Freelon, Merritt, et al., 2015, p. 177)

Freelon et al's work focuses on tech blogs' coverage of social protests (the Arab Spring and Occupy Wall Street) and the role that "internet centrism" and technological optimism plays within coverage compared to "mainstream news" (Freelon, Merritt, et al., 2015, pp. 176–177). Four of the digital outlets that I have analyzed were included in Freelon et al's research (*Ars Technica, Gizmodo, Gigaom,* and *Wired*).

Watson's (2016) investigation of the trajectory of technology criticism and critical technology coverage also explores similar digital outlets, but Watson's work is focused on interviews with technology critics and journalists in order to understand how issues covered by technology writing have changed over the last few decades. Watson argues that the history of news and writing about technology is comprised of three phases. First, the technological optimism and boosterism of the 1990s–seen especially in outlets like *Wired Magazine*. This era also saw the shift from industry and trade focused technology coverage, like IDG publications, to more popularly accessible styles and stories. Second, the earlier 21st century period, the gadget era, which focused on an "optimistic and gadget-loving ethos" and covered "the proliferation of consumer devices" (Watson, 2016, p. 14). Apple's iPhone launch in 2007 exemplified this period, but the arrival of smartphones (like the iPhone) and social networks (like Facebook), according to Watson's research, also began a shift in technology coverage's discussion of the "relationship between technology and everyday life" (Watson, 2016, p. 15). The most recent phase is the post-Snowden era, which begins in the middle of 2013 after the

revelations by Edward Snowden about US and other governments and corporations extensive global surveillance. Watson argues that the "revelations forced journalists, thought leaders, and citizens to begin untangling just how much of the tech industry was complicit in building a global surveillance network" (p. 17) which also contributed to technology coverage "shift[ing[from tech-as-tool to tech-as-system" (p. 18). Coverage of technology, according to Watson, had been

> dominated by PR cycles and product releases, coverage has moved beyond the breathless declarations of "the next sexiest thing" that marked the early days of publications like *Wired* and *Gizmodo*. Recent coverage reflects an expanding definition of technology, from materials and mechanisms to the people and systems behind them…When gadgets were no longer the story, gadget blogs realigned themselves toward covering the structures, histories, and ethics that support and surround technologies. (p. 18)

Other scholars have noted that gadget journalism is a new form of gatekeeping and that "journalists play a significant part in diffusing, explaining and interpreting … new technologies" (Geiß, Jackob, & Quiring, 2013). Sterne's (2007) work on the discourses surrounding obsolescence also identifies tech reviews and gadget coverage as an important site of analysis. While Watson's project aims to offer an account of "constructive technology criticism" (2016, p. 3), in popular media and technology journalism, criticism of technology has tended to be silenced through referencing the Luddite movement, which DeLuca (1999) illuminates through E. P. Thompson's work. According to DeLuca, "Luddite is a rhetorical weapon…used to silence those who question progress" (DeLuca, 1999, p. 156). Watson's work also discusses some how the "distinctions between reporting and criticism are blurring. Even the most straightforward reporting plays a role in guiding public attention and setting agendas" (Watson, 2016, p. 3). Watson's work offers some historical guide posts to examine; my dissertation explores

a similar time period that Watson reviews and explores how the coverage of e-waste reflected some of these patterns or phases of technology coverage. Watson's premise is that this new phase of technology coverage reflects more concerns about social implications and effects of technology and offers more nuanced criticism than simply technology is great (technological optimism, centrism) or tech is bad (dystopic). According to Watson, constructive technology criticism and coverage

> skews toward optimism, or at least toward an idea that future technological societies could be improved. Acknowledging the realities of society and culture, … [it] offers readers the tools and framings for thinking about their relationship to technology and their relationship to power. Beyond intellectual arguments, constructive criticism is embodied, practical, and accessible, and it offers frameworks for living with technology. (2016, p. 3)

My project offers an entry point to begin assessing these trends through examining how technology coverage has dealt with an environmental justice issue about technology.

While Watson focuses on how technology coverage has changed over the last two decades, the broader landscape of news and journalism has also changed (N. Davies, 2011; Deuze, 2005; Fenton, 2010c; Gerhards & Schafer, 2010; Meikle & Redden, 2011; Pew Research Center, 2016; Tandoc, 2014). In general, the net profit rates of journalism and news media companies have decreased, while consolidation and concentration in both legacy and digital media institutions has increased (McChesney, 2013). Some profit margins were maintained, due "in part, by aggressive cost-cutting" resulting in reduced staff and budgets for investigative journalism (Benson, 2010, p. 189). The 2008 great recession exacerbated these trends as did the audience shifts towards digital news consumption. The format, tone and conventions of news and information also changed and the influence of social networking and mobile publishing expanded (Meikle &

Redden, 2011).

2.6.3. Environmental Journalism

Technology journalism is one aspect of this research project; environmental journalism is another. Coverage of the environment, like technology, can constitute a beat within a news room. As discussed in the environmental communication section of this chapter, research continues to examine how the environment and environmental issues like climate change, toxic waste, air pollution, and environmental activism are covered by news outlets. These issues are also explored through studying science communication, but as Freelon et al. (2015) discussed, there has been minimal examination of media outlets other than mainstream, legacy news coverage for how technology is covered, and as my project explores, the overlaps of technology and environment issues. Research has focused on issues like the role of blogging and online communication practices of environmental NGOs (Doyle, 2009; Merry, 2010) and citizens' use of internet sites for information and political engagement with environmental issues like climate change (Almiron & Zoppeddu, 2015; Gavin, 2009; Haider, 2016).

Some legacy media outlets have attempted to expand their coverage of environmental issues, but these initiatives are also subject to economic imperatives and the overall trends that are devastating the news industry. For example, the NYT environmental reporter Andy Revkin "started the influential *Dot Earth* blog in 2007" which the NYT incorporated into their Green Blog in 2009 (Painter, 2013, p. 128) By early 2013 the green "silo" was closed and the NYT encouraged "every desk to cover the environment as part of what it does" (Cox & Pezzullo, 2016, p. 97). NYT public editor

Margaret Sullivan reviewed the effects of the decision later in the year, noting that quantity and quality of environmental coverage, especially about climate change, decreased (Cox & Pezzullo, 2016; Sullivan, 2013). In addition to the previously discussed churnalism and the increasing reliance on public relations material as investigative journalist staff were reduced, science and environmental reporting seems to have been hit particularly hard. Twenty years ago "nearly 150 [US] papers had a science section. Now fewer than 20" remain and most of the reduced content is used for "lifestyle and health" topics (Cox & Pezzullo, 2016, p. 97, quoting Daley, 2010).

There continue to be gaps in research that looks at "patterns of media coverage/portrayal of environmental issues/matters" longitudinally and outside of legacy media institutions (Hansen, 2015, p. 386). Maxwell and Miller have argued that media studies needs to move away from non-materiality but they have also noted that environmental communication's focus on texts and representations of the environment is important work that must continue–especially ecological materialist interdisciplinary work that looks at how messages work within journalistic norms and practices and how audiences receive messages about the environment (Maxwell & Miller, 2012, p. 20). My project helps to address some of these gaps by using a case study of 12 years of media coverage of an issue that crosses journalistic beats–technology and the environment–while also exploring how an important part of the CE/ICT infrastructure, e-waste and disassembly, was covered in media outlets not traditionally examined in scholarship.

2.6.4. Summary and Research Questions

> In combination with the increased publicity of science journalism that is focused on ecological problems, the sharing of publicly available information on the material reality of the life cycle of ICT/CE has begun to dampen popular enchantment with media technology (Maxwell & Miller, 2012, p. 25)
>
> High-tech journalists are also beginning to temper their enthusiasm of the wonders of digital luxuries (Maxwell & Miller, 2012, p. 161).

Accounts of the e-waste activist networks' achievements and policy struggles often use media coverage and corporate policy shifts as indicators of activist successes and failures. As yet, however, few if any systematic studies have examined how these struggles impacted discourses and narratives about the social and environmental consequences of CE/ICTs. In some respects, electronic waste was an entirely new issue for many news outlets, thus the e-waste activists had some ability to determine how, initially at least, to craft the narrative. Yet, e-waste also implicated some of the most powerful global corporations and industries, their priorities and messaging were also important to the development of the news coverage of e-waste. Critical communications researchers have used popular sources of technology news to investigate discourses and framings of technology adoption and consumption, but there is not much work that links to environmental justice movements. Using the case of e-waste to explore technology news coverage, this project also offers a historical contribution into early 21st century shifts in news media and a documentation of how the changing news media covered environmental activism. E-waste as a news story reflects an opportunity to study the trajectory of an issue that revealed many of the structural forces of exploitation of people and the environment that CE/ICT infrastructures connects with, but did the media tell that

story? And if so, for how long? How, for example, did e-waste activists' early focus on cultural consonance support hegemonic traction of sustainable capitalism?

My dissertation examines a period of growth in a key part of the consumer electronics infrastructure. The extraction and disassembly phases of ICTs become more integrated, while consumption of electronics expands greatly. While the e-waste story initially examines pollution and exploitation, the issue evolves into the story of technical solutions to manage the environmental problem and a business opportunity to profit from the problem through re-extraction Thus the extraction and disassembly phases of the circuit are in many respects increasingly becoming one and the same, yet they are different phases in time. We need to see how the actors of environmental justice movements are trying to change the unjust "circuits of exploitation," and a primary way that e-waste activists did this during the early 21st century (2002-2013) was by media messaging and policy campaigns. Specifically, my study addresses the following questions:

RQ1. How does the media story of electronic waste change over time?

RQ1a. What differences exist between legacy and digital media coverage about electronic waste?

RQ2: To what extent did legacy and digital media news coverage of electronic waste reflect environmental justice or sustainable capitalism perspectives?

RQ2a: What social and environmental justice issues are present and absent in the coverage of electronic waste? How did media coverage of electronic waste portray environmental activism?

RQ2b: How were issues of digital inequalities and consumerism discussed in the coverage of electronic waste?

This chapter has tried to explore some of the complexities that e-waste issues reflect and which are reflected in the research questions. The visual overview of the

frameworks and literature shows some of the ways the different chapter sections relate and overlap (see Figure 2.1.). Critical political economy of communications, ecological materialist media studies and development communication for social justice hold much of the discussions around CE/ICT infrastructures, consumption, inequalities, neoliberal hegemony, post-colonial critique and discourses of technology; Environmental sociology and social movement studies grounds much of the research around sustainable capitalism, ecological modernization and environmental justice. Social movement studies offers a lengthy tradition of exploring the dynamics of social justice and hegemony through media systems while also connecting with development communication for social justice through advocacy and transnational social justice. Environmental communication literature offers a range of research concerning both media coverage and discourse surrounding environmental issues, policy and social movements. Also reflected in the diagram are the areas where I've discussed context or background on e-waste issues and activism as well as the final section of the chapter which seeks to integrate social movement studies about NGOs and public relations with political economy of technology news institutions through journalism and media coverage of science, technology and the environment.

The next chapter reviews the methods and research processes I used to investigate these issues in order to answer the research questions. Here is a summary of how the first two chapters connect to the research questions:

RQ1. How does the media story of electronic waste change over time? RQ1a. What differences exist between legacy and digital media coverage about electronic

waste*?* The coding categories used in the content analysis were derived from my background research about e-waste activism, policy and environmental justice issues as discussed in chapter one. Throughout chapter two I have reviewed literature and research about e-waste which helped me craft the study, such as my discussion of certification programs, or e-waste activist accounts of their media strategies. Scholarship that looks at media coverage of NGOs, environmental and social justice movements and public relations also informed how to design the study as did my discussion of commodities and obsolescence, consumerism, the political economy of CE/ICTs and technology news coverage.

RQ2: To what extent did legacy and digital media news coverage of electronic waste reflect environmental justice or sustainable capitalism perspectives? This question explores the degree to which sustainable global consumerist capitalism themes appear in coverage of electronic waste as compared to counter-hegemonic environmental justice themes. My review of critical political economy, transnational neoliberal globalization and sustainable development, ecological modernization and sustainable capitalism informed this research question, as did my review of neoliberal hegemony, environmental justice and e-waste activist documents, environmental social movements, public relations and media coverage.

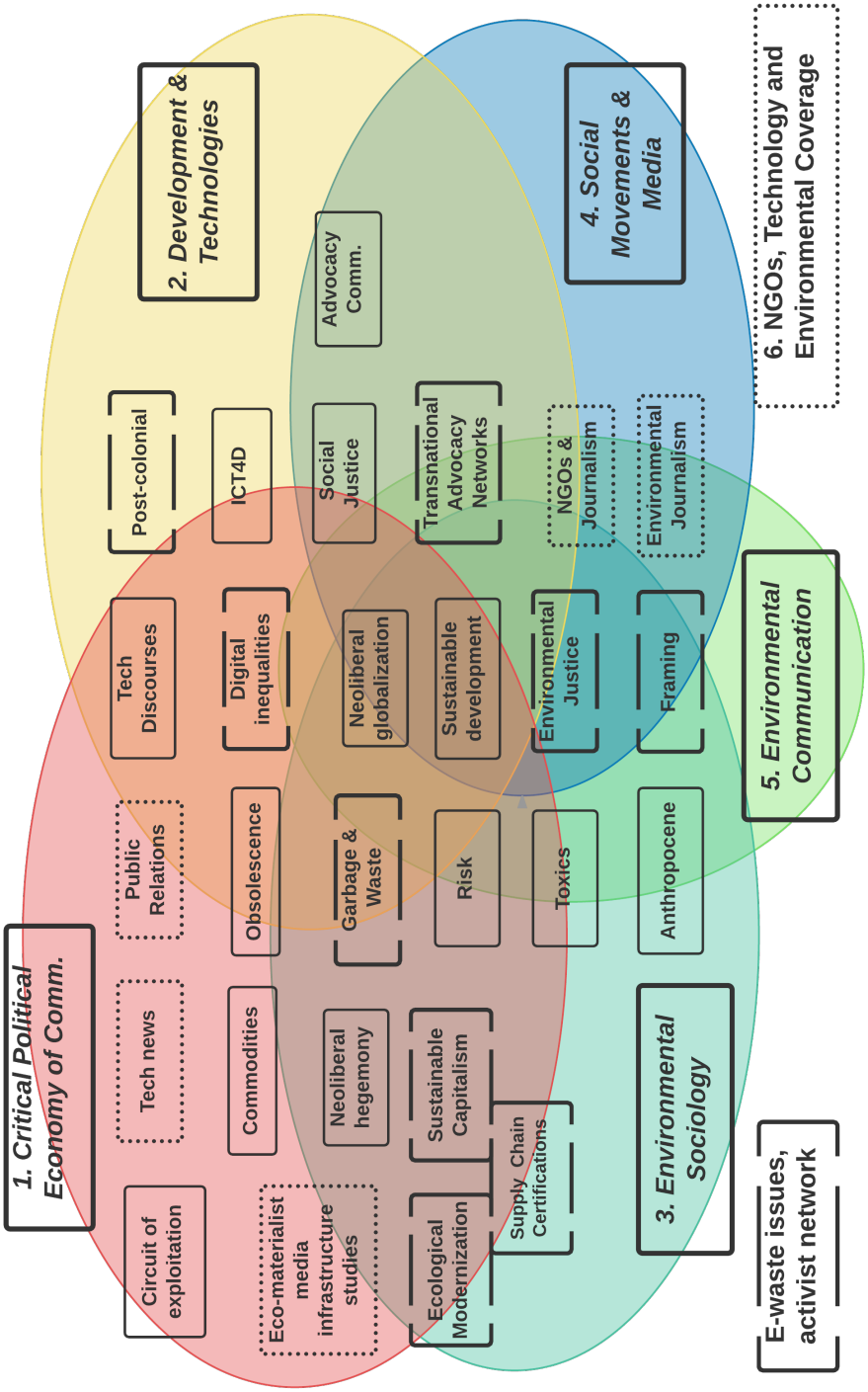


Figure 2.1. Intersections of context, frameworks and literature

RQ2a: What social and environmental justice issues are present and absent in the coverage of electronic waste? How did media coverage of electronic waste portray environmental activism? My discussions about absence and ideological hegemony, post-colonial critiques of development and technology and media coverage of environmentalism informed question one. I also drew from political economy and eco-materialist media infrastructures and environmental communication research on representations and discourses of toxins, risk, waste and environmental crisis. I explored the second question through the literature on environmental social movement studies, framing theory and research on NGOs and public relations.

RQ2b: How were issues of digital inequalities and consumerism discussed in the coverage of electronic waste? My discussions of obsolescence, ICT4D, post-colonial and post-development critiques of technology transfer and digital inequalities informed how I approached digital inequalities. My discussion of political-economy and commodities, obsolescence, the culture-ideology of consumerism, technology journalism and media infrastructures informed how I approached consumerism.

CHAPTER III

METHODS

This chapter reviews the methodological framework of critical realism and strong objectivity and examines the methods of content analysis and document analysis and methodological considerations for digital documents. Following this, the chapter reviews the research questions and an overview of the media outlets used in this study. The iterative research process is described as are the procedures and protocols for the content analysis and the document analysis process.

3.1. Methodology

This study conducted a mixed methods investigation of media coverage of electronic waste through quantitative content analysis and qualitative document analysis. While quantitative methods investigate patterns of social behavior, involve counts and measures, and are predictive through longitudinal assessments of aggregated data (Wimmer & Dominick, 2006), qualitative methods are descriptive, give context and assume that investigators have subjectivity (Berg, 2006; Creswell, 2007; H. J. Rubin & Rubin, 2005). Method triangulation is essential for reflecting multiple realities that qualitative research can generate and for strengthening and deepening quantitative research with qualitative accounts (Denzin & Lincoln, 2008). The mixed method approach enabled data triangulation in order to find the "convergence of meaning" to best answer the research questions. (Lindlof & Taylor, 2011, p. 241).

Methodology is "the terrain where philosophy and action meet" (Sprague, 2005, p. 5). Quantitative methods rely on an objective epistemology–that knowledge is generated through empirical observations made by neutral investigators. This approach to

knowledge building is derived from positivism, which has a realist ontology: Positivism says that reality is a priori and singular; and it uses scientific methods involving data that are quantifiable, measurable, and generalizable (Wimmer & Dominick, 2006). The critical paradigm has a material-realist ontology, with a central idea that reality is impacted by historical, race, gender, and class structures (Denzin & Lincoln, 2008; Lindlof & Taylor, 2011). Critical theory is generally derived from Marxist and dialectical materialism analysis.[34] This research is also critical through Mosco's definition of critical epistemology, which emphasizes the emancipatory and comparative nature of knowledge production (Mosco, 2009, p. 128).

This mixed method project incorporates complementary approaches to knowledge production and evidence (Jensen, 2013). Jensen's articulation of "methodology complementarity" for media studies research clarifies that realism as an epistemological framework is useful for incorporating several forms of "evidence and inference, interpretation and explanation" that this research project includes (2013, p. 297). Additionally, Foster, Clark and York (2010) point to Harding's work on strong objectivity (Foster et al., 2010, p. 341) as way to strengthen the links between critical theory and realist epistemologies. Through this approach, Harding's (1993) strong objectivity derived from feminist standpoint theory is included in the epistemological underpinnings of this project and provides links between the quantitative content analysis and the qualitative document analysis.

Strong objectivity, according to Harding, "requires that the subject of knowledge be placed on the same critical, causal plane as the objects of knowledge" through "strong

[34] Critical theory expanded significantly over the last thirty years and is also influenced by cultural studies, feminism, queer studies, critical race theory, post-structuralism and post-colonialism.

reflexivity" (Harding, 1993, p. 72). The strong reflexivity needed for strong objectivity is found through feminist standpoint theory, which emphasizes that knowledge production is "socially situated" (Harding, 1993, pp. 56). For the purposes of this project, I follow Sprague's (2005) defining of "social standpoint epistemology" as it addresses criticism and the expansions of standpoint theory that have occurred over the last 20 years while offering researchers guidelines for addressing one's privilege and power within method design.[35]

Klein (2014) and Foster, et. al (2010) emphasize that for structural change and environmental justice to happen, science and science discourse constitute crucial processes. There needs to be an embracing of science and the methods of empirical science at the same time as acknowledging the problems and weaknesses of positivist/objectivist assumptions. This project attempts to engage with that dynamic. The project uses the objective method during the content analysis and uses the researcher's interpretative analysis during the document analysis. Furthermore, this research examines structural injustice and representations of marginalized and colonized peoples by a white middle class woman from a privileged global location (the United States) who has participated in social and environmental justice activism in various capacities over most of my adult life. Feminist social standpoint epistemology and Harding's strong objectivity are a way to account for my privileged position in the research.

3.1.2. Methods

Murdock's (2013) review of early content analysis research in social science

[35] Sprague suggests the following: "work from the standpoint of the disadvantaged, ground interpretations in interests and experience, maintain a strategically diverse discourse, and create knowledge that empowers the disadvantaged." (Sprague, 2005, p. 75)

reminds researchers that mixed methods to analyze content were used much earlier than the debates between quantitative and qualitative methods tend to suggest. Murdock recounts Max Weber's call in 1910 for descriptive, quantitative content analysis of newspapers as the first phase of research "that will proceed to qualitative [analysis] [sic]" (Murdock, 2013, p. 58). While content analysis can be used for theory building, research can be descriptive and used to investigate phenomena "as a prelude to other types of research" (Riffe, Lacy, & Fico, 2005, p. 14). The research design of my project reflects this intention.

3.2.1. Content analysis

Content analysis has a lengthy history in social science research about media and communications. Early 20th century researchers studied differences in content from different types of news outlets (tabloid or "yellow" journalism as opposed to "serious" news), newspaper's crime reporting patterns, wartime radio music content to determine levels of enemy support, and popular magazines' use of biographies to idealize American characteristics (Lowenthal, 2004; Murdock, 2013; Wimmer & Dominick, 2006). The administrative tradition of communications research supported a positivist approach to content analysis, especially since the procedures were formalized by Berelson (Berelson, 1952; Lazarsfeld, 2004).

The trajectory of content analysis research reflects key distinctions and assumptions in mass communications research related to the powerful and limited effects of media as well as more recent research that explores contingent effects like cultivation theory and agenda setting. Content analysis also has been used to study issues related to media

production and news routines (Riffe et al., 2005). More recently, content analysis continues to be used to investigate patterns of representation, stereotypes, agenda setting, and issue framing research (D'Angelo & Kuypers, 2010; Santana, 2013; Somaini, 2014). Images (multimedia and photography) are also a site for content analysts, especially using the "presence and absence" of representations (Nettleton, 2011). Additionally, content analysis is used frequently in environmental communication research to examine patterns of media coverage of environmental issues such as climate change (M. Boykoff et al., 2010; M. T. Boykoff, 2008; Eide et al., 2010; Takahashi & Meisner, 2013).

Content analysis aims to investigate patterns and measures of a variety of content types such as newspapers articles, visual imagery, interview transcripts, and advertisements. The benefit of content analysis is that it is unobtrusive: No one knows that content is being analyzed, and the data is not contingent on people as research subjects. However, quantitative content analysis suffers from issues of generalizability if content variables are not clearly operationalized. It also tends to provide primarily descriptive statistical information and benefits from being used as part of multi-method approaches (Riffe et al., 2005).

3.2.2. Document Analysis

In some respects this project is an extensive document analysis–one part of the analysis uses quantitative content analysis, and the other part uses interpretative document analysis. Documents "express and represent a set of discursive practices...[which are] recruited as allies in various forms of social, political and cultural struggle" (Prior, 2003, p. 13). Documents can be a variety of primary material artifacts

like letters, stock reports, diaries, emails and meeting minutes and secondary materials like news articles.

Scott defines a document as "an artifact which has as its central feature an inscribed text" (Scott, 1990, p. 5). Prior (2003) and Allen-Robertson (2010) argue that documents, particularly digital documents, need to be considered as part of the "researcher's field of action" or the "conceptual boundaries" that locate the study (p. 4). Documents are also actors and are able to impact human action (Prior, 2011, p. 20). Allen-Robertson expands this to include issues in news coverage, where an article covering an event may have contributed to changing the outcome of events or "may have at the time, within the field of action, brought about changes and alterations in the field itself" (2011, p. 5). This insight is very pertinent to a study that investigates trends and patterns in media coverage of a phenomena or historical period. In the case of this research, there were numerous moments when the news story was another news story, especially stories that crossed mediums–so a TV broadcast investigating illegal e-waste dumping was then covered as a news story about the TV broadcast in a separate print or online outlet.[36] The news story was that the TV broadcast about the topic or event had happened.

Scott's (1991) typography of documents as evidence is useful for a systematic accounting of the documents. Documents need to be assessed for their authenticity, credibility, representativeness, and meaning. Issues of authorship (personal and official) and access (closed, restricted, open-archival, open-published) also need to be considered (Scott, 1991, p. 6). Authenticity is concerned with soundness (whether a document is an

[36] For example, a *60 Minutes* broadcast of "The wasteland: Following the trail of toxic e-waste," a feature on e-waste disposal and informal disassembly sites in Guiyu, China (Granatstein, 2008).

original or a "technically sound copy") and with authorship–whether it was created by the person or institution the researcher assumes to be the original author (1990, pp. 20–21). Scott advocates for using internal and external evidence to determine a document's qualities of authenticity. Credibility, or whether a document is trustworthy, can be assessed through an author's sincerity–their justifications or motivations surrounding the document's production. A document's credibility also reflects issues related to accuracy. Scott notes that the traditional preference for primary sources is based on assumptions that proximity increases accuracy–that one who is close to an event in space or time is a more accurate observer/author than a second-hand account. Primary documents are produced by the institution or person–like meeting notes, public relations materials, annual reports from a company, or a personal diary. Secondary documents are second-hand accounts–like a news article reporting on an annual meeting of a company. However, first-person accounts by primary observers are not necessarily more accurate than other accounts. Scott clarifies that a document's credibility is located within a matrix of these qualities, all of which could provide a researcher with information. So a primary source for a document could be sincere in their account while at the same time be inaccurate; thus, it would be a credible but not accurate document.

Scott's review of representativeness focuses on issues surrounding the survival and availability of documents, primarily in analog situations. Many of these issues continue regardless of the format of the document (analog or digital). In terms of digital documents, there continue to be cross-disciplinary efforts to improve issues of archival procedures as well recommendations for data management for social science research (ICPSR, 2012). Issues of access and data management are important considerations in

this project as many of the articles analyzed did not exist in academic databases. This is why institutional websites' search features and Google advanced domain name searches were used in the data collection of this study. Furthermore, even though some of the outlets (legacy news outlets primarily) are archived through online databases (LexisNexis and Factiva) and are accessible through university libraries, these archives do not provide access to the multimedia content like images, videos, slideshows, and graphics that accompanied a story. Scott's (1990) final category of meaning concerns the comprehensibility of documents both literally (is it readable, useable, understandable– particularly in terms of historical context for terminology, formats, language conventions) and interpretatively, in terms of a clear analysis strategy.

3.2.3. Digital Document Analysis

However, as useful as Scott's typography is, it is unfortunately focused primarily on analog documents. As this project investigated internet-based media coverage (either published exclusively on the internet or the digital versions of print publications), additional considerations are needed in terms of an analysis process. Allen-Robertson (2011), building upon Scott (1990) and Prior's (2003) work, argues for the expansion of these criteria as well as a shift in terms that more reflects the realities of digital production and internet infrastructure. In many respects the internet is an archive of archives, or a "meta-archive" (Allen-Robertson, 2011, p. 6). This structural feature enables document authors to use tagging, embedded hyperlinking, and automated trackback or linkback[37] which enables more access to related documents but also

[37] The term linkback refers to computer protocols that enable websites to talk to each other in three different ways–pingback, trackback, refmention, webmention. (in terms of links and sharing of links).

potentially can "direct the reader's gaze" toward evidence that supports claims or positions sought by the author (Allen-Robertson, p. 6 referencing Featherstone, 2000). Researchers must be sensitive to errors in digital documents, both human and machine, in terms of analog documents being uploaded or transferred to the internet. However, increasingly documents are not "translated to digital but are instead directly inscribed into it," so transferring errors could potentially become less a problem (Allen-Robertson, 2011, p. 6). Furthermore, and most important in terms of political economy, many of the archives and online spaces in the meta-archive of the internet are privately owned, often by large corporate institutions. Access can be limited in terms of paywalls, subscription fees (like the LexisNexis Academic database, where many of the documents for this project came from), as well as algorithmic search engines that can impact the reproducibility for researchers.[38]

Issues of authenticity and credibility also change when working with digital documents. The technical structure of the internet means that any document collected via the internet is in fact, technically, a "copy of a copy" (Allen-Robertson, 2011, p. 16). There is no certainty that what a researcher reads in the present moment of data collection or analysis is the same content from the document's supposed production date. Seeing documents as fixed and authentic artifacts "becomes undermined by the malleability of what has been produced" (Allen-Robertson, 2011, p. 17). Allen-Robertson also cautions researchers to be mindful of "internet echoes" that can "artificially inflate" an event or news story (p. 15). Echoes occur when a story is published on one site and then quickly is

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https://en.wikipedia.org/wiki/Linkback

[38] In this project, all websites were accessed using the same browser (Firefox) and with no adblocking software used. This means that a researcher with a different browser, different browser history, etc could potentially (most likely) see different search results for the same search terms. See McChesney (2013) and Pariser (2011).

published on other sites, highlighting a central function of the internet–"the dissemination of the same information via multiple channels" (p. 16). This aspect of internet-based document collection is why I chose to focus on specific news and media outlets rather than a broad census of possible coverage during the entire time period. Furthermore, to account for some of the issues surrounding the malleability of internet documents, I collected PDF versions of articles that were only produced on the internet. This ensures that I have a copy of what the document was when I collected it, not just the text of the article.[39]

3.2.4. Timeline

While this study is not a formal critical discourse analysis, it does incorporate some method suggestions for document analysis, particularly Carvalho's (2008) assessment of "contextual" analysis[40] of media constructions (p.163). Carvalho describes this as investigating "the temporal evolution of media(ted) discourse to produce a history of media constructions of a given social issue" (2008, p. 172). As Carvalho notes, though this has been done through quantitative content analysis, there is minimal analysis of "the discursive means of meaning" (2008, p. 174, note 23). Allen-Robertson's (2011) larger research project of documenting the history of the development of digital distribution from 1997–2010 sought to explore a time-based account of a phenomena. Allen-Robertson's use of an iteratively generated timeline built through digital document

[39] This archiving aspect of this research project became even more important after one of the media outlets studied, *Gigaom*, ceased publishing in 2015. While the site still hosts its archives of articles, there is no guarantee that those articles (and the links that this dissertation cites) will be available to future researchers. By having an archive of the content, further analysis can occur, regardless of whether *Gigaom*'s original content remains online.

[40] "A biography of social and political issues in the media is missing. When it is taken up, research on change in media discourse has been mainly oriented to issues of style and genre, rather than to change in the meaning of the issues in the media." (Carvalho, 2008, pp. 163–164)

analysis enabled preliminary understanding of the order of events but also became a tool through which to explore how the documents related to each other and events. Through cross-referencing with other documents related to events, validity of the information was strengthened.

As some of the research questions for this project relate to changes in media coverage of e-waste issues over time, this approach to building a chronology through the documents was helpful in understanding "pattern[s] or causal development[s]" (Allen-Robertson, 2011, p. 9). Of particular importance to this process was the timing of investigative reports by e-waste activist organizations; the initial phase of generating coding categories and the content analysis seemed to hint at some relationships that needed to be explored in the second, interpretative phase. Please see Appendix A for the timeline. The following section first reviews the research questions and discusses how the different phases of research approached the questions. An overview of the media outlets used in the study and a discussion of their popularity and ownership is next, followed by a summary of the research steps.

3.3. Research Questions and Media Outlets

This dissertation seeks to contribute towards understanding why and how the media story of e-waste evolved in the ways that it has and to explore how the issue was covered by different types of media–legacy news and digital media that focus on technology and gadgets. The research questions guiding this project are best answered through the multi-method approach described previously.

RQ1. How does the media story of electronic waste change over time?

RQ1a. What differences exist between legacy and digital media coverage about electronic waste?

RQ2: To what extent did legacy and digital media news coverage of electronic waste reflect environmental justice or sustainable capitalism perspectives?

RQ2a: What social and environmental justice issues are present and absent in the coverage of electronic waste? How did media coverage of electronic waste portray environmental activism?

RQ2b: How were issues of digital inequalities and consumerism discussed in the coverage of electronic waste?

RQ1 and RQ1a were primarily explored through quantitative content analysis following preliminary research and a review of coverage that indicated salient categories. The coding categories used in the content analysis were derived from existing studies that examine e-waste activist accounts of their framing strategies and research that looks at media coverage of environmental and social justice movements, consumerism, and technology news coverage. After the quantitative analysis was completed, these research questions were also used to assess the qualitative differences among types of media coverage, in order to expand the quantitative findings. Additionally, as discussed in the previous section, a timeline was created over the course of the research that identified policy events, actor interventions, and historical moments related to e-waste issues (Appendix A). This timeline was used during the qualitative document analysis in order to explore the time-based findings from the quantitative results with historical moments related to the issue and actor interventions. News coverage, document analysis, and background research provided the dates and events to include in the timeline.

The second set of research questions explore the "boundaries of discourse" about the social and ecological consequences of consumer electronics and consumerism (Pan & Kosicki, 2001, p. 41). They look at what is seen and unseen in the 12 years of media

coverage of electronic waste. RQ2 explores the degree to which sustainable global consumerist capitalism themes appear in coverage of electronic waste as compared to counter-hegemonic environmental justice themes. The content analysis and the document analysis assessed the degrees to which these various perspectives were present within coverage. The qualitative analysis built upon the findings of the content analysis, which provided descriptive counts for the coverage of different topics related to the broader concepts behind this group of questions, i.e. environmental justice and sustainable capitalism perspectives. The content analysis examined the various topics and topic indices to see what, if any, relationships existed among different types of topics and actors in news stories. The results of these tests informed the qualitative analysis. For example, if a measure of environmental justice topics was found to be significant, I then examined articles that were in these results to explore more in depth how they reflected these qualities (of environmental justice or sustainable capitalism).

RQ2a was explored in the quantitative analysis by including topics that are related to electronic waste issues but also connect to other social and environmental issues, such as supply chains and Anthropocene. These findings were then further examined in the qualitative analysis. The second question about portrayals of environmental activism was explored first through the quantitative analysis which addressed descriptive information regarding activism in the coverage and provided overview of the frequencies and depth of the inclusion of the activism and reports topics, as well as activist sources. The qualitative analysis expanded this and I explored in more detail articles or time periods that had strong activist inclusion from the quantitative analysis.

To answer RQ2b, the qualitative analysis examined how digital inequalities and consumerism was discussed in coverage, again using the results for the quantitative analysis to inform where to look in the article collection. In the preliminary quantitative phase, there were not enough examples that seemed to meet the qualities of a specific topic about digital inequalities, so these concepts were folded into the consumerism and justice topics, depending on the context of content. Additionally, during the coding period, I noted articles that discussed topics not tested in the quantitative analysis. These extra topics were not included in the reliability testing but were used as part of the initial coding for the qualitative analysis.

The quantitative content analysis focuses primarily on the first set of research questions while contributing insights towards the second set of questions. Some of the content analysis does work towards answering the other questions, but the bulk of the results and discussion of the content analysis in chapter four will focus on the issues of time and media type. The critical document analysis and the iterative process used throughout the research focused on both question areas. Chapters four and five report the results and discussion of the content analysis and document analysis respectively, and the final chapter summarizes the findings and conclusions of both chapters and the project as a whole.

3.3.1 Legacy media

Legacy news sources were selected from the top five largest circulation size United States based newspapers that were searchable by LexisNexis or Factiva. Circulation size was determined through the Pew Center's research, which used the Audit

Bureau of Circulations' publishers' statements in 2010.[41] The top three circulating newspapers as of 2010 were included in the study (the *Wall Street Journal, USA Today, The New York Times)* as was *The Washington Post* (fifth largest circulation). *The Washington Post* was included because the e-waste issues were often related to federal legislation (or lack thereof), and the outlet, in addition to having large circulation, also covers the federal government. The *Associated Press* wire runs in many smaller papers and, as Weaver, et al's (2009) content analysis of media coverage of nanotechnology revealed, "almost half of the stories in major, big-city newspapers also originate from the AP" (p. 152). The *Associated Press* was included as a separate source–stories that appeared with an *Associated Press* byline in the other outlets examined were excluded from the study.

3.3.2. Digital media

The guiding criteria for the digital media outlets was that the outlets should reflect a diversity of ownership, be highly popular according to the best rankings available during the research period[42] (Droge, et. al, 2010), generate original content (not just aggregating other news stories), and have searchable archives. Tech outlets had to exist during some of the coverage cycle–all except *Gizmodo* and *Gigaom* started publishing by 2001. Gizmodo started in 2002, and *Gigaom* started in 2005. Only one of the digital media outlets, IDG, was searchable in LexisNexis. Though IDG owns a range of

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[41]Rick Edmonds, "State of the Media 2011: Newspapers: By the Numbers" (Pew Research Center, 2011), http://www.stateofthemedia.org/2011/newspapers-essay/data-page-6/.

[42] Alexa.com currently and formerly Technorati, but the blog and website ranking feature of the site has since been shut down.

publications, such as *PCWorld*, *MacWorld*, *Network World*, and *ZDNet,* for this study IDG was considered one digital media outlet, regardless of publication title. In terms of audience, the digital tech news outlets in the study include trade and industry focused outlets like the IDG publications. *Ars Technica*, *Wired*, and *CNET* came of age in the 1990s and had an audience of tech enthusiasts, workers, and industry. *Gigaom's* audience was the tech industry while *Gizmodo* approached news about technology and gadgets for a popular audience, albeit one interested in technology (Freelon, Merritt, et al., 2015).

During the bulk of the time period, *Slashdot*, *Engadget*, and *Gizmodo* were the top three technology blogs. *Engadget* and *Gizmodo* offered searchable archives and original content and focused on new product information, while *Slashdot* did not (Droge, et. al, 2010). *Engadget* focused primarily on gadget reviews and less on technology news coverage and was acquired by AOL/TimeWarner in 2008. Since diversity of ownership of the digital sites was a criteria of the study, *Gigaom* replaced *Engadget* so that two of the digital outlets were independently owned–*Gizmodo* and *Gigaom*. *Gizmodo* was started by Nick Denton and the Gawker Media organization in 2002 and until recently remained independently run by Gawker Media. *Gizmodo* was recently sold to Univision following Gawker Media's bankruptcy due to a lost lawsuit (Ember, 2016). Om Malik founded *Gigaom* in 2005, and it remained an independent company until early 2015, when it ceased operations due to lack of funding and sufficient revenue to cover debt (Carson, 2015). A startup, Knowing Corporation, purchased some of Gigaom's assets, including its website domain name, in 2015[43] ("About Gigaom," 2016).

Both *Gizmodo* and *Gigaom* are some of the "original nodes" of the "tech

[43] *Gigaom* ceased operations on March 9, 2015 due to lack of funding and sufficient revenue to cover debt (Carson, 2015). A pdf copy of all articles analyzed from the *Gigaom* website was created before the outlet ceased operations.

blogosphere" which came of age during the early millennium and grew extensively during the period that my research project studies (Oremus, 2015). *Gizmodo*, and its larger media family, Gawker Media, can be considered "the first real digital media company" which

> understood the pace, culture and possibilities of online news. And it used that understanding to unleash a set of technical, business and journalistic innovations on the news industry that have altered the way we produce, consume and react to media today (Manjoo, 2016b).

While *Wired* magazine has been used in content and textual analysis investigations (Fisher, 2010; Kelly, 2009; Millar, 1998), the other digital outlets have had little scholarly attention (Freelon, Merritt, et al., 2015).

There is some scholarship that supports using "gadget news" as a short hand for technology specific coverage (Edge, 2011; Watson, 2016). But, following Watson's (2016) analysis of the trajectory of technology coverage and criticism and the work of the Project for Excellence in Journalism (Lu & Holcomb, 2016), which defines "digitally native news sites" as different than legacy news outlets, I categorized the gadget and technology focused outlets based on the conditions of their founding (i.e. digital outlets were primarily started or consumed through the internet, as opposed to the legacy media which arose during the analog era of the 19th and 20th centuries).[44] Table 3.1 reviews the outlets analyzed in this study and provides an overview of each outlet's ownership during the 12 years of analysis.

[44]There are some problems with this distinction: 1) most of the IDG publications were started as print magazines in the 1980s and 1990s (e.g. MacWorld in 1984), and 2) Wired.com includes content published in Wired magazine. But in general the distinction is a useful categorization.

3.3.3. Research Steps

The initial research phase consisted of researching existing literature on e-waste issues, environmental communication research (activism, climate change, social movements), public relations, and environment and risk communication, as well as previous studies with e-waste activists. Article collection occurred after I determined through the preliminary research what the time boundaries for the study would be (2002-2013). While collecting and formatting articles for analysis, I reviewed articles' headlines and scanned for initial exclusions. Throughout the initial research and article collection phases, documents were collected and archived. These documents included reports and media elements referenced in articles. This digitization process collected images and links to media elements contained in an article and generated PDFs of articles that were not included in academic database webpages. The project timeline that identified policy events, actor interventions, and historical moments related to e-waste issues was iteratively generated throughout these phases. This "long soak" within the existing literature and news coverage, both through article collection and the preliminary coder training process, helped to refine and clarify coding categories (Hall, 1975, p. 15). This research was used to generate operationalized descriptions of a range of topics related to electronic waste issues and the broader concepts of environmental justice and sustainable capitalism.

A preliminary analysis of news coverage of e-waste in the *San Jose Mercury News*, an outlet excluded from the main study, was used in initial category operationalization, coder training, and a pilot study. Following initial coder training, the content analysis began. A full description of the content analysis procedures, including

the research population, inclusion and exclusion criteria, inter-coder reliability, coding processes, and data analysis follows this section.

The qualitative analysis of the coverage began during the content analysis. Throughout the research phases, I maintained a journal of observations of initial themes and categories. I also reviewed documents and reports mentioned in news articles that were content analyzed. After the statistical analysis was complete, the document analysis occurred in depth. Throughout this methods chapter I have discussed various components of the iterative process involved in the document analysis. A short summary follows the review of the content analysis procedures.

Table 3.1 Media outlets and ownership information

Outlet	Ownership in 2002 and/or significant investors	Ownership by 2013 and parent company or significant investors [a]	Ownership changes since 2013
Legacy			
AP	Not-for-profit cooperative	Not-for-profit cooperative	
NYT	The New York Times Company	The New York Times Company * / Carlos Slim	
USA Today	Gannett	Gannet *	
WSJ	Dow Jones Company	News Corp *	
WaPost	Graham Holdings Company	Nash Holdings LLC [b] **	
Digital			
Ars Technica	Ars Technica	Condé Nast Digital (Advance Publications) **	
CNET	CNET Networks	CBS Interactive (CBS)* / (National Amusements)**	
Gigaom	Giga Omni Media	Giga Omni Media **	Knowing Corporation (2015)**
Gizmodo	Gawker Media	Gawker Media **	Univision Communications (2016)**
IDG	International Data Group, Inc.	International Data Group, Inc.**	McGovern Foundation [c] (2014)**
Wired.com	Lycos	Condé Nast Digital (Advance Publications)**	

Note: Dates of media outlets ownership changes during the period of study:
2002 - *Gizmodo* founded.
2006 - *Gigaom* founded. Condé Nast buys *Wired*.
2007 - News Corp buys the *Wall Street Journal*.
2008 - Condé Nast buys *Ars Technica*.
2008 - CBS Interactive buys *CNET*.
2009 - Carlos Slim becomes largest shareholder of *The New York Times*.
2013 - Jeff Bezos/Nash Holdings LLC buys *The Washington Post*.
[a] * = public company, ** = private parent company
[b] Holding company owned by Jeff Bezos.
[c] Family foundation of deceased founder of IDG.

3.4. Content Analysis Procedures

3.4.1. Inclusion Criteria

The research population was a census of articles derived from a purposive sample of legacy and gadget media coverage of electronic waste from 2002–2013. The unit of analysis was individual articles using full text databases that mentioned “e-waste” OR “electronic waste” OR “electronics recycling” for search dates of 01/01/2002 to

12/31/2013. Articles were found through LexisNexis, Factiva, individual site archives, and Google advanced domain search.

As this study was looking at how the story was told about e-waste, non-traditional news format articles were included. The important criterion was that the content was written by the outlet. This could include articles that were re-posted from other sites but with the outlet's perspective or copy as the content with a link to the original piece. An example of this would be a gadget media article talking about a *60 Minutes* broadcast covering e-waste issues. The article coded was the gadget media reporting on the *60 Minutes* broadcast. This was also to account for the genre of blog-like reporting found in gadget media outlets which do not necessarily reflect the traditional norms of journalism that legacy press coverage is assumed to have. (citation about press norms) Editorials, opinion columns, how to columns, and question & answer format articles were included in the population.

3.4.2. Exclusion Criteria

The search parameters generated 1382 articles, but almost half (43%) were excluded from the population. The high number of exclusions is partially a result of the LexisNexis formatting of *Washington Post* articles–many articles contained e-waste calendar event items as a footer to articles whose content was not related to the study. In addition to excluding duplicates, articles were excluded for the following reasons:

1. Bylines noting reprints or that the material was published originally by another outlet. If the *Associated Press* was listed as the byline for a *Wired* article, that article had to be found through the *Associated Press* LexisNexis search results, or it was excluded.

2. New summaries, digests, and aggregation of external links to other outlets. However, news reports were included, but only the section/mini article about e-waste was coded.

3. Reader generated content like forums, comments, and letters to the editor as well as content that was produced from live online question and answer columns.

4. Article metadata. Articles appeared in search results only because they contained a link to a different story about e-waste, or had a tag code or footer information at the end of the article (a series of links to related stories).

5. Non-US or non-national edition articles. Particularly for the legacy media outlets like *The Wall Street Journal* and *The Washington Post*, which had many articles for specific regions, like the Maryland Edition of *The Washington Post*. Usually these articles were often duplicates as well.

6. Community event calendars and e-waste event announcements with no content other than the logistical details of the event.

7. Article medium is non-text based, like a slideshow, podcast, or video. If the multimedia content was included as part of another article, this was noted in the coding process.

8. Feature format/long read articles (word count <1000) with barely a mention of the key word search terms.[45] Including these articles in the coding process would mean coding numerous quotes and sources that were not discussing the subject at all.

9. Interviews and book reviews.

10. Captions of graphical elements in an article.

[45] For example, article #12052 (word count = 1400) had one sentence that included the words "electronics recycling". also, #12040, 15031

After exclusions, approximately 800 articles were included in the population (n=792). Due to limitations of time and resources for human coding, the population was reduced using stratified sampling to get a representative sample in order to reflect how "language likely changed with time" (Riffe et al., 2005, p. 108). The benefits of using this approach means that the sample of media stories about electronic waste reflects the various events and actor interventions that generated or received media coverage. This also means that because there are more stories in various news and media outlets during particular years, the stratified sample reflects this proportionately and increases the representativeness of the sample. Using a random number generator and yearly strata based on type of media, the total population was reduced by half (n = 402; 177 legacy articles and 225 gadget articles). Table 3.2 shows the total articles by media type per year.

3.4.3. Unit of Analysis

The unit of analysis was a media article. The media type (legacy or digital), year category (12 possible), text location (sec 1 or sec 2) and article length (short, long, or very long) were independent variables. The dependent variables were topic, source type, device category, and article type. Following Riffe, Lacy, and Fico's (2005) recommendation to clarify meaning units within content analysis, the topics and devices were subject thematic units while source types were referential units. Structural thematic units enable researchers to explore "how concepts of interest … can be identified structurally" and are "useful in developing narratives, explanations, or interpretations of content" (Riffe et al., 2005, p. 78). A referential unit of analysis "can be used to measure the meaning attached to a particular person, event, or issue" (p. 67).

Riffe, et. al (2005) use an example investigating the Gulf War, whereby persons providing quotes or information were coded as types of sources, thus as referential units, which "were used to analyze where newspapers got their information about the war" (p. 66). The software program Statistical Package for the Social Sciences (SPSS) was used to run a range of descriptive statistics on the data. Nonparametric statistical tests were also used to investigate some aspects of the research questions. These tests were the Chi-square goodness of fit test and the Independent Samples *t*-test.

Table 3.2 Number of Articles by Outlet and Year Group

	2002	2003	2004	2005	2006	2007	2008	2009	2010	2011	2012	2013	Total
Legacy													
AP[a]	4	5	2	8	7	9	11	1	2	1	3	1	54
NYT[b]	6	2	2	5	8	5	7	6	3	8	8	5	65
USA[c]	2	1	1	1	0	3	8	2	3	3	1	1	26
WSJ[d]	0	1	2	0	1	2	2	1	1	1	1	1	13
WP[e]	0	2	1	4	1	0	5	2	1	2	1	0	19
Total Legacy	12	11	8	18	17	19	33	12	10	15	14	8	177
Digital													
ArsT[f]	0	0	0	0	3	5	4	1	3	6	4	3	29
CNET[g]	6	4	5	6	2	4	19	11	5	7	5	4	78
GIG[h]	0	0	0	0	0	4	4	4	4	1	4	2	23
GIZ[i]	0	0	0	0	0	2	8	7	4	1	2	2	26
IDG[j]	2	3	3	4	3	6	4	4	4	5	2	3	43
WIRE[k]	1	6	1	1	3	4	5	0	1	1	1	2	26
Total Digital	9	13	9	11	11	25	44	27	21	21	18	16	225
Total	21	24	17	29	28	44	77	39	31	36	32	24	402

Note.
[a]*Associated Press*. [b]*The New York Time*s. [c]*USA Today*. [d]*Wall Street Journal*. [e]*The Washington Post*.
[f]*Ars Technica*. [g]*CNET*. [h]*Gigaom*. [i]*Gizmodo*. [j]*IDG* publications. [k]*Wired*.

3.4.4. Coding Articles

Scott (1990) identifies the "technical measurement procedures" for content analysis. These procedures require that all sources of relevant data must be examined for comprehensiveness and that the analysis must have exhaustive and mutually exclusive categories and an independent classification of items (p. 131). As Scott (1991) notes, this approach moves beyond "frequency counts to an assessment of the significance of particular items and approaches" (p.154). Content analysis categories "depend upon an interpretative judgment on the part of the researcher" (Scott, 1991, p. 153). This project followed Scott's assessment of the interpretative process of developing coding categories. The coding categories were derived from existing studies that examine e-waste activist accounts of their framing strategies and research that looks at media and environmental justice, activism, consumerism, risk, science, and technology.

Metadata for articles was collected during the article retrieval process. This data included article date, title, author/byline, section (if available), article length (word count), and if there were any graphics. Articles were coded in a text-only, printed format, similar to the LexisNexis search results format. Gadget articles not available in university databases were collected in both PDF and .doc format. A PDF image of the entire article as it appeared online was collected, not for use during content analysis, but to confirm any missing metadata and *to have for future research*. These articles were then converted into the text-only document format, the word count was calculated, and all articles in the sample were printed. This was done to ensure that text of articles was the focus for coding rather than the different fonts, formats, graphics, and multimedia elements used in the different outlets.

Articles were broken up into two sections. Section 1 ended after the first five paragraphs and included the article title, lede, and/or subhead sentences located before the beginning of the article. Section 2 was the remaining content in the article.[46] Articles less than 250 words, regardless of paragraph formatting, were coded entirely as Section 1. Section 2 was the remaining content of articles–long articles of 251–1000 words, and very long articles with 1001 words or more. As the short articles did not have the possibility of section 2 content coding (see coder instructions, Appendix B), Section 2 text location section differences were not included in further tests.

Journalists often assume that readers tend to not read past the beginning of an article and use the inverted pyramid structure and the nut graph to place the most significant information at the beginning of stories (Scanlan, 2003). Additionally, Weaver, Lively, Bimber (2009) have noted that "lead frames in newspaper stories" are just as "reliable as proxies for coding full-text context" (p. 154). However, because this study investigates media outlets that are not necessarily traditional journalism organizations, the entire article was coded, albeit in two sections so that issues of journalistic practice of the inverted pyramid (the primary information of an article is placed in the top half or top third of a news story) could be explored, while the article as a whole could also be studied.

After breaking the article into two sections, coders then coded both sections for topics and sources. Coding for device mentions (7 device types) and article types (4 article types) occurred through the coding process and could be located anywhere in the article. A topic was coded if it was discussed more substantively than a mention of a key

[46] The only exception to this was when a question and answer (Q&A) article type was split between sections. In these cases, coders were instructed to include a question and its answer in the same section. If the question fell at the section break, it was included in second section.

word. Topics were not exclusive; an article could reflect multiple topics. Coders were instructed to use the range of possible relevant details in the topic definitions to decide if a topic was discussed. Sources were coded by counting all quotes or reported speech indicators that were attributed directly or indirectly to an actor. A list of 93 verbs was included in the codebook to assist coders in identifying indirect quotes. This list and the overall approach identifying indirect quotes was generated through combining journalist education material (Stovall, 2013) and research on computer assisted tagging and content analysis of newspapers' use of reported speech (Krestel, Bergler, & Witte, 2008). Actors were identified according to the codebook description, and all direct and indirect quotes for each actor category were counted. Actors are persons, groups, institutions, or organizations and can also be views or opinions attributed to these people and organizations. Device categories were generated using a combination of industry classifications, consumer guides, and activist reports. The coding for article types was done primarily to assist in determining what types of articles were in the population and to locate types of content included in articles (e.g. how-to sections and multimedia elements) for the qualitative analysis. Please see Appendix B for the full codebook, which details the complete coder instructions.

3.4.5. Coder Training and Reliability

This project used a "blind coder" who knew little of the study and research area. The coder was a doctoral student in a different discipline (educational administration). They held no training in media and communications nor in environmental studies. Using the blind coder encouraged "judge independence" or the freedom to make judgments

without input from the researcher, which helps to minimize coders "trying to give researchers the desired outcome" (Neuendorf, 2002, p. 133).

In addition to encouraging judge independence in coding decisions, using a blind coder not familiar with many of the protocols and formats of journalism or the literature on environmental justice and social movements also required a training period to train the coder about basic features of news coverage, e.g. identifying indirect quotes and indirect attribution or verbs and phrases that allude to activism. During the training period, the codebook was iteratively revised, using a pilot study. The pilot study used a selection of random articles from *San Jose Mercury News*–a legacy media outlet not included in the final population, but one that had extensive coverage of e-waste.

Following the coder training and the iterative codebook revisions, reliability testing began. Two coders, myself and a doctoral student, coded a total of 64 randomly selected articles, which represented 16% of the sample (n=402), as recommended by Wimmer and Dominick (2006). The author, as primary coder, coded the remaining 338 articles. Reliability testing occurred throughout the coding process to ensure that reliability remained consistent. First, 40 articles (10% of the sample) were co-coded and high inter-coder reliability established. During this process, the codebook continued to be refined. Following the first reliability test, reliability was tested at intervals of 100 articles (so after 100 articles, 200 articles and 300 articles). At each of these reliability checks, high reliability was confirmed, and then solo coding by the primary coder continued.

There were 79 coding decisions: 23 topics and 11 sources coded for two text locations, and seven device categories and four article types coded for the entire article. All but the source types coding were dichotomous variables. Source types were counts of

all quotes in the article section by actor type.

A percent agreement greater than 92% was achieved for all 79 variables tested. For the 57 dichotomous variables, a variation of the Scott's pi formula was applied: the percentage of agreement by chance was computed using the normal approximation to the binomial distribution (Potter & Levine-Donnerstein, 1999, p. 280). All but four dichotomous variables had Scott's pi greater than .90. The remaining four dichotomous variables had Scott's pi greater than .80. The testing of source counts proved a little more difficult. Though all 22 source variables had percent agreement above 92%, five source variables had Scott's pi below .80. The other 17 source type variables were above .80 Scott's pi. Reliability was run again on the source types as dichotomous variables (so was the source type seen in the article section at all, instead of how many times the source type was quoted). Using this approach, Scott's pi greater than .90 was achieved for all source type variables.

3.5. Document Analysis Process

The qualitative document analysis included all long articles (251–1000 words), (n=70) analyzed in chronological order, as well as articles selected based on the research questions and the results of the descriptive statistical analysis. I reviewed the entire population of article (n=792) titles in date order to get a sense of the chronology of the news coverage and patterns within headlines. I used the journaling process during the content analysis to generate initial memos about articles. I noted when topics discussed were topics that were not included in the quantitative analysis, and I explored how issues like digital divide, Earth Day, e-mining/urban mining, and green IT language were

represented in the coverage. I also used initial notes and observations about each article that I wrote during the content analysis coding process to inform the first round of the document analysis and to refine initial categories of themes.

The initial analysis was the text of the articles, the same as in the content analysis, but where appropriate, the original formats of articles were used. The content analysis coded for graphics and multimedia elements. Occasionally, I looked to these elements or versions to deepen my analysis. This study analyzed the census of media stories collected, as detailed in the sample section of this chapter. Additionally, two other categories of documents were analyzed: (a) documents relating to ownership patterns and corporate practices of the media outlets and CE/ICT companies; (b) e-waste actor generated documents produced by activists, e-waste sector businesses, or government representatives which were referenced in media coverage. For example, activist research reports that were produced by e-waste activist organizations received a significant amount of coverage. I looked to these various e-waste actor generated documents to clarify or expand upon my observations.

The extensive iterative process of categorization of themes and patterns within articles also grew from the in-depth operationalization of the coding categories conducted at the beginning of the research process. After I reached a saturation point in my analysis, I gradually categorized and reduced the themes and observations about the 12 years of coverage in order to best answer my research questions. The next chapter reports the findings and discussion of the content analysis, and chapter five discusses the findings of the document analysis.

CHAPTER IV

COMPARING COVERAGE OF E-WASTE, 2002 - 2013

> Ted Smith, one of the founders of the SVTC, ETBC, and ICRT, stated about the network's frames: "I think the one that is most effective is that electronic waste is toxic waste. That's still, after all these years, that's still shocking to most people…it is the single strongest argument to get people's attention." (Interview with Ted Smith, ETBC, April 21, 2009, quoted in Edge, 2011, p. 158)

This study examines media coverage of electronic waste between 2002 and 2013. At the beginning, media attention focused on the harmful materials in electronics, extended producer responsibility (EPR), legislation and the burgeoning electronics recycling sector. In addition to the harmful materials and EPR, two other key environmental justice concerns–the growing amount of e-waste and that e-waste is toxic waste–were also covered fairly substantively between 2002 and 2003. However, media attention shifted over time, so that what began as a media story grounded in environmental justice concerns becomes more about the growth of the e-waste infrastructure and the improvements to electronics so that more consumption can be sustained. While it is still shocking that electronics become toxic waste, media coverage of e-waste increasingly reduced attention of that concern and instead focused on other, less seemingly shocking topics. While harmful materials and EPR were covered comprehensively in the beginning, by the end, between 2012 and 2013, media coverage focused on consumerism and the e-waste sector. This chapter reviews the findings of the quantitative content analysis. The results and discussion focus on answering how the coverage changed over time and exploring the differences between legacy and digital media coverage. The chapter primarily addresses the first group of the following research

questions:

RQ1. How does the media story of electronic waste change over time?

RQ1a. What differences exist between legacy and digital media coverage about electronic waste?

RQ2: To what extent did legacy and digital media news coverage of electronic waste reflect environmental justice or sustainable capitalism perspectives?

RQ2a: What social and environmental justice issues are present and absent in the coverage of electronic waste? How did media coverage of electronic waste portray environmental activism?

RQ2b: How were issues of digital inequalities and consumerism discussed in the coverage of electronic waste?

After a brief review of some key moments in the issue cycle, descriptive information of the findings is presented. The chapter then explores the results of the content analysis in more detail, focusing on assessing the differences over time between legacy and digital media coverage of environmental justice concerns through exploring patterns between topics and sources in the coverage. After the overview of the coverage and review of the most featured topics in the coverage, two topic indexes are presented in order to delve more deeply into how environmental justice and issues surrounding e-waste labor were addressed in coverage. Sourcing patterns are then reviewed using the topic indexes, followed by a discussion of the types of devices that coverage of e-waste included.

4.1. Time Period and Issue Cycle

Between 2002 and 2013, there are a range of developments in the CE/ICT industry and within the e-waste activist network. This 12-year period covers the

engagement of new e-waste activist network actors since 2002 and reflects the period of government and corporate responses to concerns about ecological impacts of consumer electronics (Greenpeace International, 2011). (see Timeline, Appendix A). Additionally, there are massive changes in news production and distribution, such as the growth and consolidation of technology news outlets like *Ars Technica* and *CNET*. Technologically, the internet changes extensively; the internet of the turn of the century is very different 12 years later, especially in terms of aggregation and content creation. For example, at the beginning of the time period, in 2002, Google was just beginning to become a search engine of widespread popular use, Facebook did not exist, and Apple had just launched the iPod (Meikle & Redden, 2011). By the end of the time period, five ICT companies– Google (as part of its new parent company, Alphabet), Microsoft, Apple, Facebook, and Amazon–are among the top 10 most valued American corporations, according to stock prices at the beginning of 2016. The *New York Times* refers to the group of companies as the "Frightful Five" due to their expansive power and control of key elements of the global digital infrastructure (Manjoo, 2016a).

In early 2002, the e-waste activist network jointly published the report *Exporting the Harm: The High-Tech Trashing of Asia*. The release of this report was noted by activists as being "a turning point for the e-waste network because of the media attention it generated and its role in creating greater public awareness of e-waste" (Edge, 2011, p. 159). In late 2005, the e-waste activist network published another investigative report, *The Digital Dump: Exporting Re-use and Abuse to Africa* (Puckett et al., 2005). In 2006, Greenpeace increased its involvement with e-waste issues, releasing the first version of its "Guide to Greener Electronics," which Greenpeace describes as "an instant hit with a

public eager to learn about companies environmental polices" (Greenpeace International, 2011). Media coverage expanded in 2008, when *National Geographic* "feature[d] and applaud[ed]" BAN's work on e-waste, and when Oprah featured the website of the Basel Action Network during an Earth Day episode (BAN, 2011). In 2011, the Interagency Task Force on Electronics Stewardship released its national strategy document advocating for changes in terminologies–"used electronics" as opposed to "e-waste" (Interagency Task Force on Electronics Stewardship, 2011, p. 5). By 2013, the market for e-waste recycling in the United States had grown, consolidated, and crashed. The time period of the study ends in 2013 because that is the year that federal legislation, H.R.2791 Responsible Electronics Recycling Act, was proposed in Congress, in September. Furthermore, as previously discussed, the third phase of technology coverage and technology journalism began in the middle of 2013 when the Snowden revelations occurred (Watson, 2016).

Over the 12 year period, coverage of e-waste issues peaked in 2008, with 19% of coverage occurring in this year. A little more than 40% of total coverage happened between 2002 and 2007. The latter half of the issue cycle (2008–2013) had almost 60% of the total coverage. Since some of the digital media outlets either began at the beginning of study time period (*Gizmodo* in 2002) or in the middle of the early period (*Gigaom* in 2005), digital media coverage of e-waste issues lagged behind legacy coverage, which had more coverage during the early period. When the coverage peaked in 2008, both media types covered the issue almost equally: Twenty percent of all digital articles and 19% of all legacy articles appeared in that year. Digital media had more staying power, covering the issue more throughout the last half of the issue cycle. By the end of the period studied, coverage diminished to similar amounts as had existed at the

beginning of the time period; around 5% of total coverage occurred in each 2002 and 2013. See table 3.2 for the number of articles by year and media type .

4.1.1. Overview Of Coding Categories

On average, a little fewer than five topics (M = 4.78, SD = 3.02), almost seven sources (M = 6.79, SD = 6.98), and a little more than one device type (M = 1.6, SD = 1.19) were included per article over the 12-year period. Early coverage tended to be slightly longer and include more topics and more sources than later coverage. Even though there were more articles about e-waste in the later coverage period, these articles were shorter and included fewer topics. While 87.7% of the early coverage involved long or very long articles, longer articles were reduced slightly in the later coverage period, representing 81.6% of the later coverage. Since a longer article presumably gives more opportunities to discuss more topics, it is not surprising that the earlier period had higher topic means (M = 5.15, SD = 3.02) than later coverage (M = 4.52, SD = 3.02). An independent samples t-test indicated the difference in the mean topics included per article was statically significant between the early and late coverage periods, $t(400) = 2.134$, $p = .033$, $d = .22$.

Given that the early period of coverage had slightly longer articles with more topics than the later period, it is perhaps not unexpected that these articles also used more sources on average. There was a significant reduction in the use of sources between early coverage (M = 8.27, SD = 7.25) and later coverage (M = 5.79, SD = 6.63), $t(400) = 3.543$, $p < .000$, $d = .36$. While legacy media's use of sources was fairly consistent throughout the 12 years of coverage, digital media average for sources used per article

decreased from the early period (M = 7.24, SD = 7.32) to the later period (M = 4.09, SD = 4.55). Digital media's shorter articles meant that fewer topics and sources were included in coverage. The depth of coverage and the range of actors included in stories was impacted by these shorter articles. That difference speaks to some of the trends in journalism that chapter two reviewed, such as the rise of churnalism or budget and beat reductions contributing to less depth and investigative reporting, as well as shifts of audiences to digital media outlets.

4.1.2. Article Length and Format Over Time

The mean length of a story was 656 words. Legacy articles tended to be longer (M = 740.38), than digital articles (M = 589.77), a statistically significant difference with a medium effect size, $t(400) = 3.111$, $p = .002$, $d = .31$. While the mean length of legacy articles remained similar between the early and later time period, digital articles were shorter in the later time period. The majority of all articles for both media types were classified as "long" or 251–1000 words. Within the legacy media, *The New York Times* and *The Washington Post* had overall longer articles on average, while average length of the *Associated Press's* articles were closer to digital media.[47] Within the digital media, a change in average article length occurred in the later period after *Gizmodo* and *Gigaom* began publishing more content–content that tended to be shorter than other outlets. More than 70% of *Gizmodo*'s articles were less than 250 words, while *Gigaom* had no articles longer than 1000 words. See Table 4.1 for percentages of articles by outlet and length for

[47] *The New York Times* had the longest article in the sample, a long form article in 2008 which was more than 5000 words (Mooallem, 2008). Four other articles in the sample were also outliers in terms of length–two from *The New York Times* (Cotter, 2012; Rosenthal, 2011) and two from *IDG* (Erlanger, 2007; Mitchell, 2004).

coverage as whole and Table 4.2 for changes in article length averages over time.

Eight percent of all articles were editorial/opinion pieces; all but one of these were long or very long articles. Digital media had more editorial articles (9.8%) than legacy media (5.6%); both media types decreased their use of opinion pieces from the earlier period to the later period. How-to-sections represented almost 11% of all articles, with slightly more included in legacy articles (14.1%) compared to digital article (8.4%).

Table 4.1 Coverage by media outlet and article length

	Short [a]		Long [b]		Very long [c]		Word count	
	n	%	*n*	%	*n*	%	*M*	*SD*
Legacy								
AP	11	20	42	78	1	2	502.04	263.25
NYT	9	14	32	49	24	37	919.11	754.62
USA	3	12	19	73	4	15	645.88	479.61
WSJ	0	0	6	46	7	54	713	349.28
WP	1	5	13	68	5	26	1065.8	432.68
Total Legacy	24	14	112	63	41	23	740.38	569.48
Digital								
ArsT	0	0	27	93	2	7	630.59	351.00
CNET	11	14	53	68	14	18	601.94	356.86
GIG	0	0	23	100	0	0	483.65	152.57
GIZ	19	73	5	19	2	8	307.5	420.88
IDG	5	12	30	70	8	19	747.65	540.69
WIRE	5	19	18	69	3	12	614.12	349.99
Total Digital	40	18	156	69	29	13	588.77	406.50
Total	64	16	268	67	70	17.4	655.52	490.23

Note. Article length is word count which included title, lede and subheadings. When the word count was not provided by database, word count tool in MS Word was used.
[a] < 250 words. [b] 251 to 1000 words. [c] > 1001 words.

Table 4.2 Article length by media outlet and coverage time period

	2002-2007			2008-2013		
Outlet	*M*	*SD*	*n*	*M*	*SD*	*n*
Legacy						
AP	536.31	272.50	35	438.89	239.35	19
NYT	843.75	449.88	28	976.14	923.48	37
USA	777.88	572.95	8	587.22	437.34	18
WSJ	1182.17	502.54	6	966.00	372.57	7
WP	718.00	426.55	8	709.36	303.64	11
Total Legacy	723.01	432.89	85	756.42	673.58	92
Digital						
ArsT	451.38	178.20	8	698.86	378.98	21
CNET	679.96	401.63	27	560.63	327.42	51
GIG	337.00	80.53	4	514.53	146.92	19
GIZ	309.50	37.48	2	307.33	438.72	24
IDG	938.81	606.79	21	565.18	403.24	22
WIRE	572.44	326.02	16	680.80	393.81	10
Total Digital	677.06	457.97	78	541.92	369.50	147
Total	701.02	444.28	163	624.49	517.85	239

Note. Article length is word count which included title, lede and subheadings. When the word count was not provided by database, word count tool in MS Word was used.

4.2. Topics

Twenty-three topics were examined in the study. Topics were not mutually exclusive–one article could have multiple topics. Table 4.3 shows an overview of the topic coding questions. Out of all topics, nine were seen in more than 25% of articles, and only one of those, the e-waste sector, was in slightly more than 50% of all articles. Table 4.4 presents full descriptive information about all topics in order of total percentages. The top 10 topics reflect both the development of the e-waste sector and the consumer electronics industry while also including some concerns from the e-waste activist network. The remaining topics reflected many of the e-waste activist network concerns

and messaging frames like certification programs, e-waste disposal labor in prisons, and data security and environmental justice related to e-waste.

One aspect of this study is to explore how the media coverage of e-waste changed over time. As part of this goal, the discussion of the topics includes key moments in the issue cycle where the topic predominated or showed low coverage. The following section will review the topics in order of highest to lowest percentages in total coverage. Figure 4.1 shows, for the top ten overall topics by percentage, how the topic inclusion changed over time.

I briefly review the key findings for the top ten topics by overall percentage, focusing on differences between the media coverage type. Because topics were not mutually exclusive, topic indexes were used to explore patterns between the topics and media types. After detailing the process for creating the topic indexes, I then discuss the topic indexes as they relate to other topics not tested in the indexes and how the depth of coverage changed over time by media type.

Table 4.3 Topic coding definition summary

Topic	Overview questions for topics [a]
E-waste sector	Is the electronics recycling or used electronics industry or infrastructure behind the e-waste disposal chain discussed?
Legislative policies	Does the article discuss any level of government policies related to electronic waste or computer recycling?
EPR	Does the article discuss companies' responsibility with their products life-cycle? Does the article discuss electronics take back programs?
Harmful materials	Does the article discuss that electronics contain toxic and/or harmful materials or chemicals? Are materials in electronics (in products and/or manufacturing processes) discussed in terms of being harmful or bad for humans and/or the environment?
Consumerism	Is consumption (consumerism, mass consumption), use or access to electronic devices discussed? Does it discuss a product or industry event that highlights or promotes purchasing and consuming devices?
E-waste growing	Does the article discuss the context, scope, or size of e-waste problems?
E-waste is toxic	Does the article discuss e-waste as toxic or hazardous waste? Does the article discuss environmental and/or health impacts of electronics disposal?
Geography: nonOCED, South	Coded by location. Does the article locate where e-waste issues are problematic? Does the article discuss who or what geographic area is impacted by or responsible for e-waste?
Product design	Are 'green', environmental, or sustainable product design elements discussed?
Supply chains	Does the article discuss issues surrounding consumer electronics manufacturing or supply chains – processes, companies and/or labor relating to production, manufacturing, distribution and/or sale of electronics? (Topic does not include end-of-life disposal or repurposing of electronics.)
Anthropocene	Does the article discuss or connect problems with consumer electronics production, consumption or disposal to issues related to Anthropocene era environmental problems or crises?

Table 4.3 Cont.

Topic	Overview questions for topics [a]
Geography: OCED, North	Coded by location. Does the article locate where e-waste issues are problematic? Does the article discuss who or what geographic area is impacted by or responsible for e-waste?
Obsolescence	Does article discuss planned obsolescence, Moore's law, or general obsolescence of electronic devices?
Activism	Does the article discuss activism or advocacy about e-waste issues? Is environmental activism discussed?
Reports	Does the article discuss advocacy or activist investigative reports or report cards about the electronics industry?
Justice	Does the article discuss e-waste as an issue of justice, injustice, unfairness, or inhumane practices?
Disassemblers: global	Coded by location. Does the article locate where e-waste issues are problematic? Does the article discuss who or what geographic area is impacted by or responsible for e-waste?
Data and security	Are issues of data security discussed as part of e-waste issues?
Art projects	Are art projects discussed in the article? Are projects that emphasize creative or crafty uses of used electronics or e-waste discussed?
Certification programs	Are electronics recycling certification programs discussed?
Prison labor	Does the article discuss or refer to the use of prison labor in electronics recycling or disposal?
Disassemblers: US, CAN, EU	Coded by location. Does the article locate where e-waste issues are problematic? Does the article discuss who or what geographic area is impacted by or responsible for e-waste?
Disassemblers: no location	Coded by location. Does the article locate where e-waste issues are problematic? Does the article discuss who or what geographic area is impacted by or responsible for e-waste?

Note. Topics listed in order of total percentage for all articles. See Appendix A for complete codebook and full description of coding categories.

[a] Topic was coded as yes if any of the questions could be answered positively. Topics were not mutually exclusive - an article could have multiple topics.

Table 4.4 Topics in articles by media type

Topic	Legacy [a]		Digital [b]			
	n	%	*n*	%	$\chi^2(1)$	
E-waste sector	103	58.2	103	45.8	6.11	*
Legislative policies	88	49.7	78	34.7	9.26	**
EPR	73	41.2	83	36.9	0.79	
Harmful materials	71	40.1	85	37.8	0.23	
Consumerism	60	33.9	81	36.0	0.19	
E-waste growing	62	35.0	54	24.0	5.87	*
E-waste is toxic	67	37.9	48	21.3	13.24	***
Geography: nonOCED, South	54	30.5	55	24.4	1.84	
Product design	26	14.7	77	34.2	19.83	***
Supply chains	25	14.1	52	23.1	5.17	*
Anthropocene	28	15.8	41	18.2	0.40	
Geography: OCED, North	37	20.9	30	13.3	4.09	*
Obsolescence	21	11.9	45	20.0	4.78	*
Activism	28	15.8	36	16.0	0.96	
Reports	19	10.7	38	16.9	3.08	
Justice	31	17.5	24	10.7	3.93	*
Disassemblers: global	30	17.0	21	9.3	5.19	*
Data and security	14	7.9	25	11.1	1.16	
Art projects	12	6.8	22	9.8	1.15	
Certification programs	13	7.3	19	8.4	0.16	
Prison labor	10	5.7	10	4.4	0.30	
Disassemblers: US, CAN, EU	7	4.0	7	3.1	0.21	
Disassemblers: no location	1	0.6	6	2.7	2.56	

Note. Association between topics and media type as shown by Chi-Square analysis. All expected cell frequencies were greater than five. Topics listed in order of total percentage for all articles. Totals of percentages are not 100 for every source because of rounding. * $p < .05$. ** $p < .01$. *** $p < .001$.
[a] n = 177. [b] n = 225.

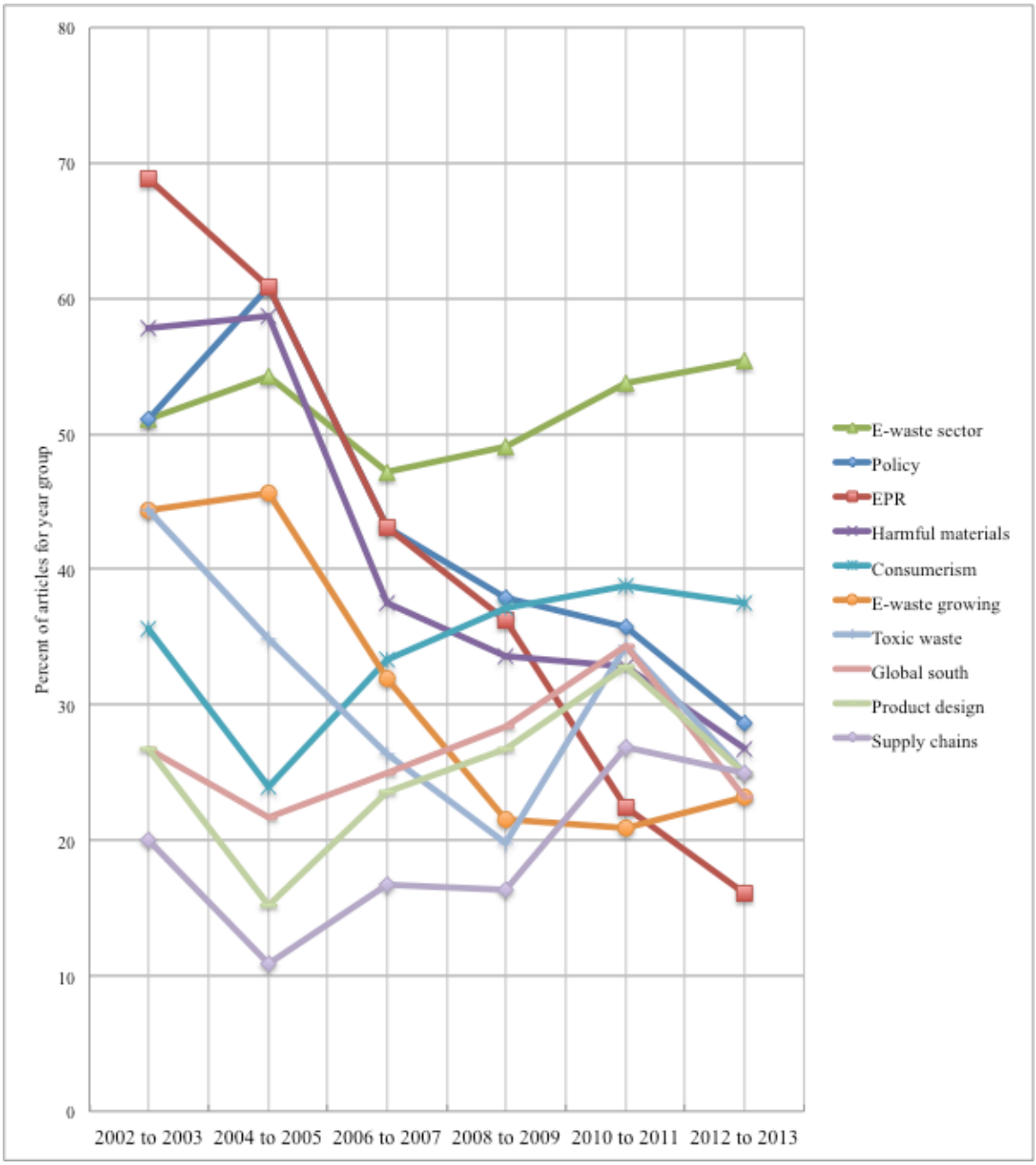


Figure 4.1 Top ten topics by percentage over time

4.2.1. E-waste / electronics recycling sector

The topic seen in the most articles was the e-waste sector topic. Slightly more than half of all articles discussed the e-waste operations and the electronics recycling sector. Almost 60% of legacy coverage included the e-waste sector while 46% of digital

coverage did, (φ = -0.123, χ^2 (1) = 6.111, p = .013). Coverage of e-waste sector issues peaked in 2004, but even at the lowest year of coverage, in 2006, more than third of articles that year included e-waste sector issues, a higher rate than most topics.

4.2.2. Legislative Policies

Slightly more than 40% of all articles discussed e-waste policies such as electronics disposal bans, advanced recycling fees, product manufacturing regulations (i.e., WEEE Directive or RoHs), or international treaties (i.e., Basel Treaty and Basel Ban). Over the entire coverage period, policy issues were the second most discussed topic. Coverage of policy peaked in 2005, when two-thirds of all articles included policy topics. It is not surprising that policy topics were extensively covered during that year – there were multiple policy struggles occurring simultaneously. These included changes to the California electronics recycling law, lobbying efforts by EMCRR to get governments to support advance recycling fees, and the release of the United States Government Accountability Office report on the federal government's role in electronics recycling. By the end of the coverage cycle, 42% of articles were discussing policy topics. Legacy media covered e-waste policy issues much more than digital media did. Almost 50% of all legacy articles discussed policy while 35% of digital media included policy topics (φ = -0.152, χ^2 (1, = 9.257, p = .002).

4.2.3. EPR (Extended Product/Producer Responsibility)

EPR programs focus responsibility for products through the complete life-cycle: at production (and extraction), use, consumption, and disposal the company is responsible

not just for safety (health) but environmental impacts too. During the first three years of coverage, EPR was the most discussed topic, with 88% of articles including EPR in coverage in 2004. Beginning in 2009 there was a drop-off in articles that discussed EPR from 42% in 2008 to a low of just six percent in 2012. Overall, EPR was the third most used topic in the coverage, seen in almost 40 % of all articles. While EPR was a frequently discussed topic, coverage did not vary significantly by media type (φ = -.044, χ^2 (1, = .791, p = .374).

4.2.4. Harmful materials in electronics

One of the reasons that electronic waste is so problematic is that electronics are made with a variety of toxic heavy metals like mercury, lead, or cadmium. During the first four years of coverage, almost 60 % (58.2%) of articles during those years discussed harmful materials in electronics. Most years, the topic reflected at least 30% of the year's total coverage. However, by the end of the study period, 2013, coverage of harmful materials in electronics dropped to 16.6% of the year's total coverage. The differences between media types and coverage of harmful materials in electronics was minimal, with both media types covering the topic at similar percentages, (ϕ = -.024, χ^2 (1) = .227, p = .633).

4.2.5. Consumerism

Over a third (35.1%) of all articles discussed consumerism, and overall it was the forth most covered topic. The topic of consumerism examined mass consumption of electronic devices and the processes that encourage, expand or profit from increased

consumption of these products. The most coverage of consumerism happened in 2010; almost 50% of the year's articles discussed consumerism. Digital media covered the topic only slightly more than legacy media, ($\varphi = .192$, χ^2 (1, N = 402) = .192, $p = .661$).

4.2.6. E-waste is growing

Nearly 30% of all articles addressed issues surrounding the scope of the e-waste problem. The topic "e-waste amounts are growing" focused on the context of e-waste issues, often quantifying amounts of e-waste or including metaphorical descriptions about the size and scope of e-waste problems. The topic was one of the e-waste activist network's communication themes. Early in the coverage cycle, the topic was found in almost 60% of articles in 2004 as opposed to later in the coverage period, when only 16.7% of articles in 2011 discussed the scope of the e-waste problem. The coverage of this topic significantly differed between media types. Thirty-five percent of all legacy media included the topic compared to 24% of digital articles, ($\varphi = -.121$, χ^2 (1, = 5.869, $p = .015$).

4.2.7. E-waste is toxic waste

Linking electronic waste and disposal to toxic and hazardous waste was another e-waste activist network messaging strategy. Similarly to the previous topic about the growth of e-waste, the "e-waste is toxic waste" as a topic was seen in a little less than 30% of all articles. The topic also saw a similar change in coverage between the early period of the issue cycle and the later period. During the first year of coverage, this topic was seen in 47.6% of articles in 2002, whereas by 2012 it was in less than 20% of articles

(18.8%). The difference between media types and coverage of this topic was more pronounced than with the topic "e-waste is growing." While almost 38% of all legacy articles discussed the topic, close to 20% (21.3%) of digital articles included the topic, a statistically significant association by media type (φ = -.181, χ^2 (1, = 13.238, p = .000).

4.2.8. Geography of responsibility and/or impacts

Where e-waste was being disassembly and disposed was an important part of the news story. Illegal toxic flows of e-waste from developed, OCED countries to non-OCED, less developed regions constituted the focus on many news reports, particularly broadcast television coverage (Granatstein, 2008; Mangini, 2009). Articles could include these topics if they discussed a location where e-waste issues are problematic or if the article discussed who or what geographic area is impacted by or responsible for e-waste. Slightly more than 15% (16.7) of all articles discussed the Global North, OCED countries, while a little more than 25% (27.1%) discussed the Global South, non-OCED locations. The global south was the eighth most included topic overall, and there were minimal differences between coverage in the different media types, with legacy media (30.5%) including the topic slightly more than the digital media (24.4%). While the Global North was included in less articles overall, the differences between the media type were statistically significant (φ = -.101, χ^2 (1, N = 402) = 4.088, p = .043). Please see Figure 4.2 for an overview of coverage of these topics over time. Figure 4.3 shows the percentage of articles by media type that included either of the location topics.

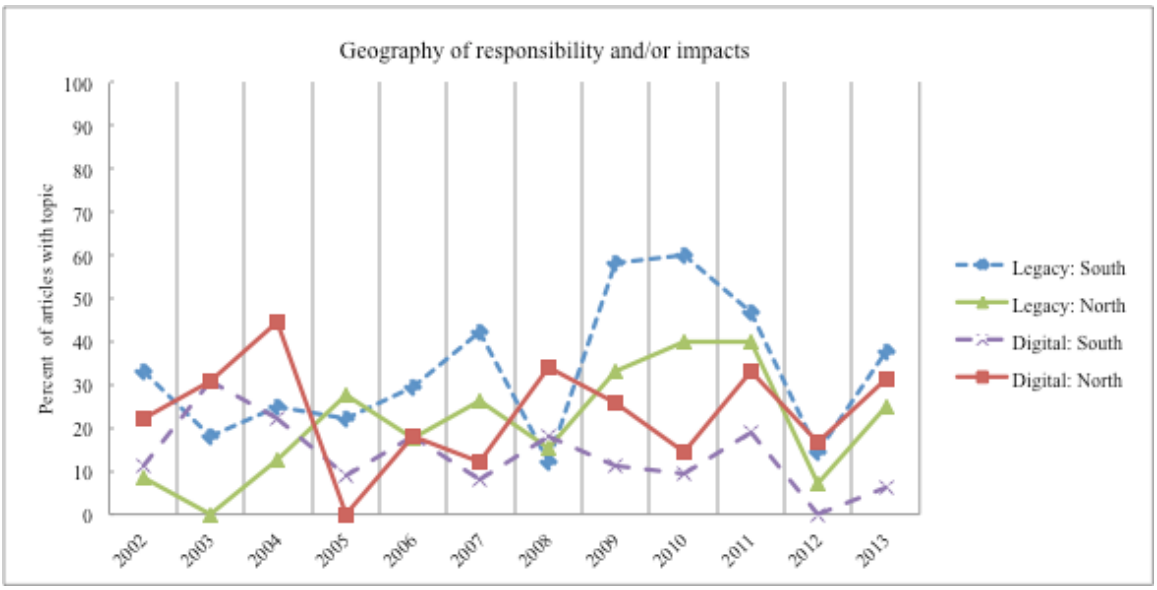


Figure 4.2. Geography of responsibility and/or impacts

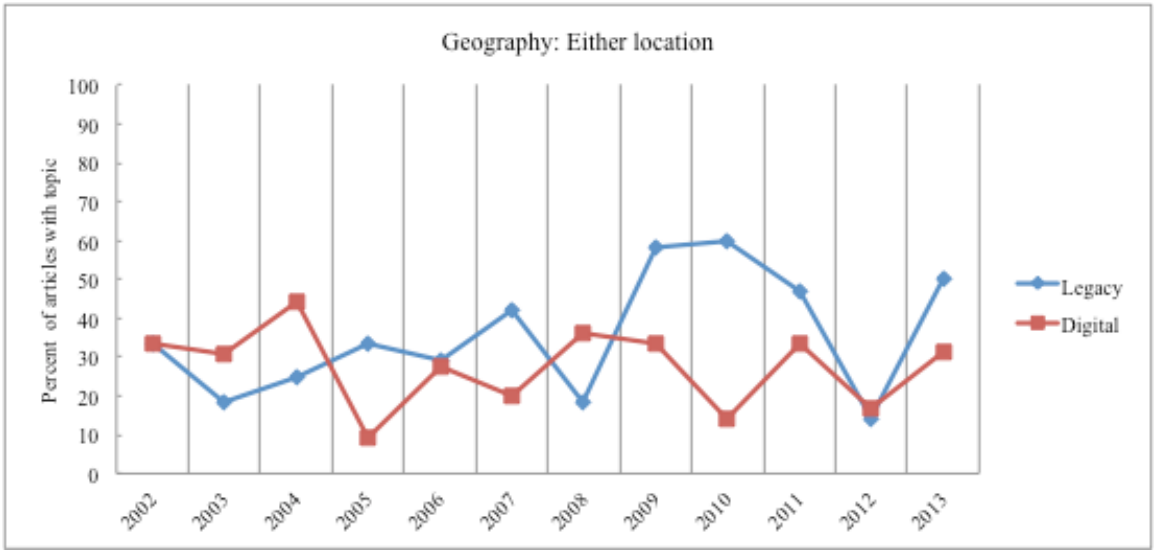


Figure 4.3. Geography of responsibility and/or impacts, either location

4.2.9. Product design

The topic of product design could refer to the entire chain of production–i.e. reducing a toxic mineral in the production of a laptop, or using recycled parts or elements in the production of a cellphone, or changing the design so a part can be replaced instead of

disposing of the product. Overall product design was the ninth most discussed topic; slightly more than a quarter of all articles included the topic. There was a noticeable difference between media type coverage of product design, with almost 35% of digital media including the topic compared to 14.7% of legacy media. Chi-square analysis showed this association between media type and product design is statistically significant, ($\varphi = .222$, $\chi^2 (1, = 19.834$, $p < .001$).

4.2.10. Supply chains

Almost 20% of articles included the supply chains topic–the tenth most included topic over the 12 years of coverage. This topic explored the issues surrounding the life cycle of electronics, especially the processes and labor involved in the production of electronics. Supply chains also involves the brand owner of products, Original Equipment Manufacturers (OEMs), who typically hold the patents for the products, and Original Design or component Manufacturers (ODM), the companies and contracted firms that physically manufacturers the products and components. Digital media included the supply chains topic in 23% of articles compared to only 14% of the legacy articles, $\varphi = .113$, $\chi^2 (1, N = 402) = 5.167$, $p = .023$.

4.2.11. Activism and reports

One of the key strategies of the e-waste activist network was the publication of investigations, report cards and multimedia documentaries for media and consumers all focused on highlighting "industry leaders and laggards" in order to pressure bad actors to

raise their standards as their better rated competitors. (Raphael & Smith, 2016, p. 333). For this study, an article had to mention one of these reports/investigations about the electronics industry. Activism was more general, any environmental activism, not exclusively e-waste activism could be coded for the topic (see Appendix B).

The topics of activism and activist reports were coded separately though they are related conceptually. While separately the topics were seen less frequently, in total, a little more than a quarter (26%) of all articles discussed either the activism or activist reports topic. However, only 17 articles (4.2%) in 12 years included both topics of activism and activist reports. Digital and legacy media included the activism topic almost equally, around 16% of articles from each media type. Almost 17% of digital media included e-waste activist reports while 11% of legacy articles included the reports. Overall coverage of reports was highest in 2002. Legacy media included activist reports in slightly more than 40 percent of articles in 2002, while over 20 percent of digital articles included reports. However, legacy media reduced their inclusion of the report topic; from 2010 through 2013 no legacy articles included the reports topic. Digital coverage of reports varied more and spiked noticeably between 2005 and 2007 when Greenpeace began their campaign against Apple and the Digital Dump report was published. While more digital media articles included the activism topic in the early period, with more than half of digital articles from 2004 including activism, by 2013 no digital articles included activism. Whereas, early legacy coverage did not included activism as much, between 2004 and 2006 more than a fifth of legacy articles did discuss activism. By the end of the coverage period, when digital media was not including the activism topic, 25 percent of legacy articles in 2013 did. See Figure 4.4 and Figure 4.5.



Figure 4.4. Activism by media type over time

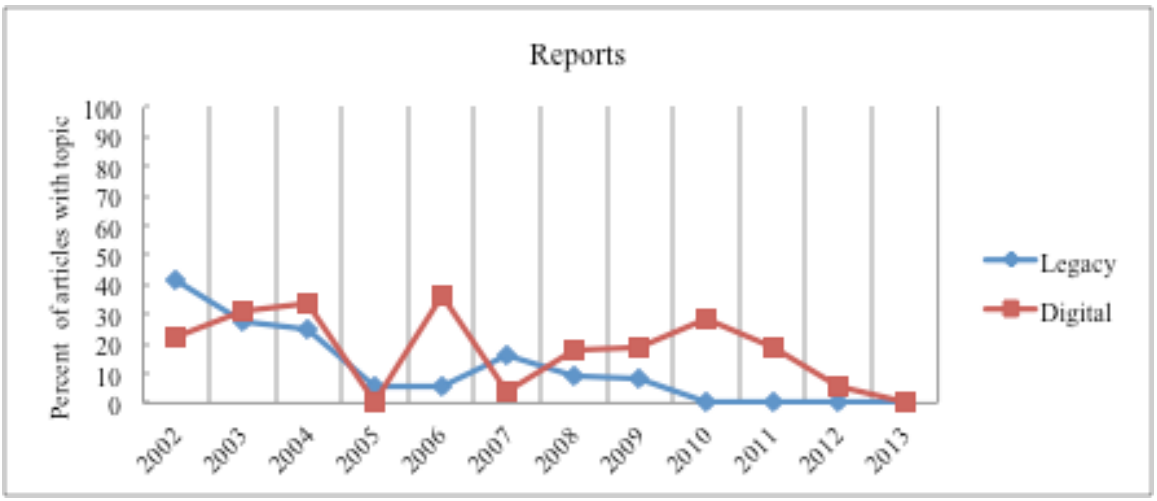


Figure 4.5. Activist reports by media type over time

4.3 Topic Indexes

Additive indexes were created to identify patterns of media coverage and to explore broad themes and concepts across multiple topics. An index was calculated by adding the summary topic score for conceptual groups of topics–this means if a topic was seen anywhere within the article. The indexes explored how different topics hung

together conceptually and were then used to explore how sourcing patterns and time periods related to groups of topics. The topic index scores for articles reflect the degree to which an article had those topics which comprised the index; a higher number was a stronger reflection of the topic index concepts. The Kuder-Richardson 20 reliability measure (KR-20) was calculated using SPSS's test for Cronbach's alpha because the variables for the topic summaries were dichotomous (the topic was either in the article or not).[48] Though the recommendation is for a Cronbach's alpha score between .7 and .9 as measure of the internal consistency of the index, indexes with slightly lower Cronbach's alpha reliability scores are included in this analysis because of the exploratory nature of this research and the relevance to the larger research questions.

The first topic grouping was the Workers index, comprised of topics covering e-waste labor–prison labor and disassemblers: US, Canada, EU; and disassemblers: global topics, as well as the justice and geography (global north or global south) topics. These topics discussed labor conditions, as well as formal and informal electronics recycling sectors and topics that focused on identifying issues of justice, fairness, responsibility, or blame for health and environmental problems related to electronic waste disposal and electronics recycling. The Workers topics scale of six topics had a high level of internal consistency, ($\alpha = .726$, $M = .786$, $SD = 1.281$).[49]

The second, Environmental Justice Themes (EJ Themes), includes nine topics encompassing e-waste activist messaging strategies: EPR, policy, certification programs,

[48] KR-20 is a "special case of Cronbach's Alpha in which the items are binary variables. The reliability procedure can calculate Alpha and therefore can calculate KR20 for binary item variables." ("Kuder-Richardson Reliability Coefficients KR20 and KR21," 2012)

[49] An alternative version of the Workers topic scale used a combination variable for e-waste labor–an article could have one mention of either of the labor topics. The WorkersCombo topic scale also had a high level of internal consistency, ($\alpha = .775$, $M = .736$, $SD = 1.188$).

justice, data security, prison labor, growing e-waste, harmful materials in consumer electronics, and e-waste as toxic waste. The EJ Themes index had moderate internal consistency, (α = .612, M = 2.127, SD = 1.787). A final index, Green IT topics, was envisioned, but the index did not achieve a high enough alpha for inclusion in further tests, (α = .424, M = 1.34, SD = 1.137). The Green IT topic index combined five topics that discussed product design, obsolescence, consumerism, supply chains, and environmental crisis. These topics could also discuss improvements to or problems with design and manufacturing processes; for instance, how to improve energy efficiency with product or server design. The environmental crisis topic addressed broad environmental concerns as they related to consumer electronics or more generally, like climate change. The failure of this topic index to achieve a high alpha shows that there was not a coherent environmental or "green" message in the articles examined.

Independent samples t-tests were conducted to determine if the index scale mean scores varied by media type. Table 4.5 reports the topic index testing by media type and notes the results of the independent-samples t-tests. A higher mean score shows that an article included more topics related to the index. A little more than one-third of all articles included coverage within the Workers index scale. Most articles examined did include coverage of EJ Themes; only slightly less than 20% did not discuss any topics related to the EJ Themes index.

Table 4.5 Topic index scores by media type

	Legacy [a]				Digital [b]				
Index	*M*	*SD*	*n* [c]	%	*M*	*SD*	*n* [c]	%	
Workers	0.95	1.46	68	38.4	0.65	1.09	76	33.8	*
EJ Themes	2.42	1.89	146	82.5	1.89	1.66	178	79.1	**

Note. Independent samples t-test analyzed the differences of mean index scores between the media type.
* p < .05, ** p < .01
[a] $n = 177$. [b] $n = 225$.
[c] Count of articles with index score > 1.

The type of media changed the strength of coverage for both topic indexes. The results of the independent samples t-test for the Workers index showed that the differences in mean scores between the media types was statistically significant, albeit with a small effect size, according to Cohen's d calculations[50], $t(400) = 2.356$, $p = .019$, $d = .23$, 95% CI [.05, .55]. The legacy media discussed topics related to workers (M = .95) more than digital media (M = .65). Similarly, for the EJ Themes index, the t-test results were statistically significant with a small effect size, $t(400) = 2.983$, $p = .003$, $d = .28$, 95% CI [.18, .88]. Legacy media articles included coverage of environmental justice themes in more depth (M = 2.42) than the digital media (M = 1.89). This expands the earlier discussion of individual topics and reveals that legacy media provided more comprehensive coverage of e-waste activist concerns than the digital media.

[50] (Becker, 2000; Cohen, 1988)

4.3.1. Topic Indexes and Time

When topic index coverage is examined over time, there are some observations worth noting. Between the media types there were fewer differences in coverage of the topic indexes in the early period, 2002–2007. As Table 4.6 shows, the mean scores of both indexes were very similar between both media types during the early period. The later time period of coverage, 2008–2013, had more differences between media types than the early period. As Table 4.6 shows, legacy media topic index scores were higher than digital media for both topic indexes, but these differences were most significant during the later period.

Table 4.6 Topic index means by media type and time period.

	Legacy			Digital			
	n	*M*	*SD*	*n*	*M*	*SD*	
Workers Index							
2002-2007	85	0.88	1.32	78	0.72	1.13	
2008-2013	92	1.02	1.59	147	0.62	1.09	*
EJ Themes Index							
2002-2007	85	2.76	1.83	78	2.60	1.83	
2008-2013	92	2.11	1.90	147	1.52	1.45	**

Note. Independent samples t-test analyzed the differences of mean index scores between the early and late coverage periods by media type.
* $p < .05$. ** $p < .01$.

Coverage of workers' issues increased from the early to late period for legacy media and decreased for digital media. The difference between the depth of coverage was not very substantial during 2002–2007, but the differences between the mean scores by media type for both indexes during the later period (2008–2013) were. It is important not to let the numbers obscure the bigger picture: Even though both media types had similar

mean scores for both topic indexes in the early period and larger differences during the later period, there are important absences that the Workers index reveals.

Articles could score a possible six on the Workers index and nine for the EJ Themes index. Between 2002 and 2007, more than 60% of all articles scored zero on the Workers index. The mean score of the Workers index did not change too much over the 12-year period studied. During the early coverage period, 2002–2007, the Workers topics mean for all articles was only slightly lower (n = 163, M = .80, SD = .1.23) than later the coverage period, 2008–2013, (n = 239, M = .77, SD = .1.31).

Coverage of Workers topics slightly increased in the later period–but only through the legacy media. Digital media reduced their inclusion of workers topics. During the six-year period between 2008 and 2013, slightly more than two-thirds of articles did not include any discussion of Workers index topics. During the late period, the coverage of Workers Issues changed: Legacy media increased and digital media decreased, a difference that was statistically significant with a small effect size, t (237) = 2.324, p = .021, d = .29. The absence of workers' issues will be further discussed in this chapter when sourcing patterns are examined.

The EJ Themes index showed that coverage did examine environmental justice issues, but coverage decreased overtime. The overall/total of all articles' early coverage of EJ Themes (M = 2.69, SD = 1.82) was stronger than the later coverage (M = 1.74, SD = 1.66), a difference that the independent samples t-test found to be statistically significant with a medium effect size, t (400) = 5.368, p <.001, d= .54). Both media types decreased their coverage of EJ Themes between the early and late period, but the digital media reduced their coverage more than the legacy media. Early coverage of e-waste

issues reflected environmental justice themes in greater depth than later coverage. In the early period, almost 90% of all articles scored at least a one on the EJ Themes index (an article included at least one of the nine topics from the scale). During the later period, 75% of all articles included at least one topic from the EJ Themes index. The difference in mean index scores between media types in the later time period was a statistically significant finding with a small effect size, $t(237) = 2.718$, $p = .007$, $d = .35$. Figure 4.6 shows the change of the index mean scores over time. Figure 4.7 Workers and Figure 4.8 EJ Themes, by media type.

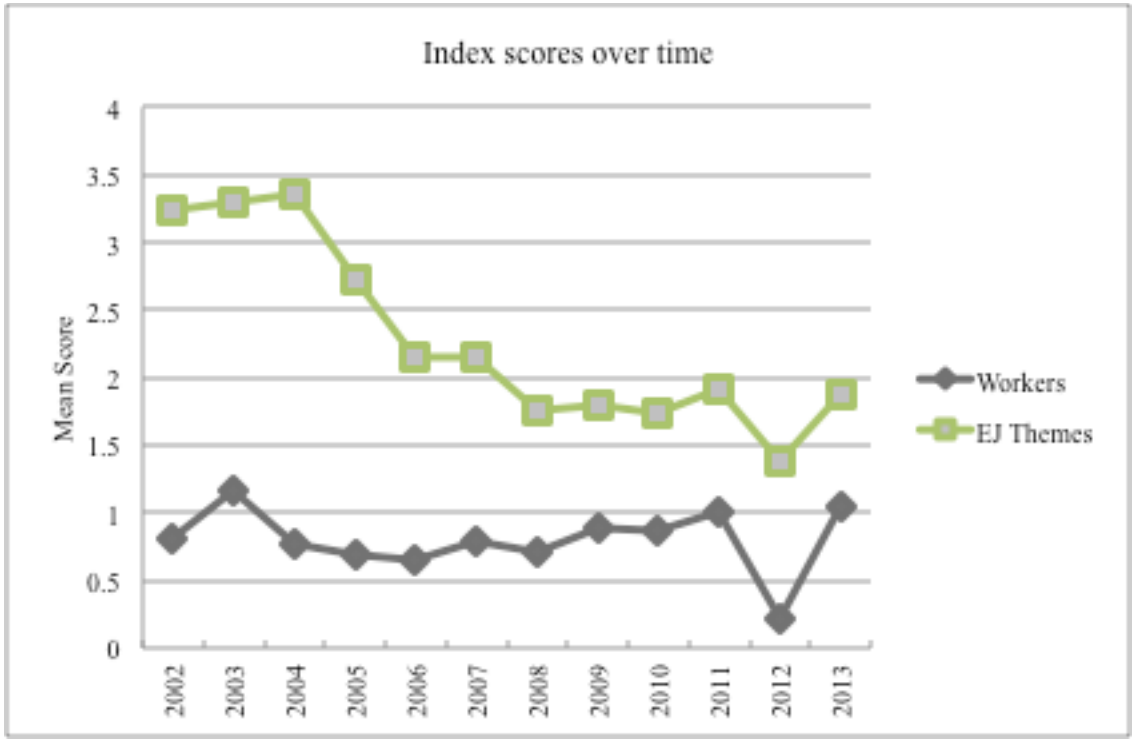


Figure 4.6. Topic index score means over time

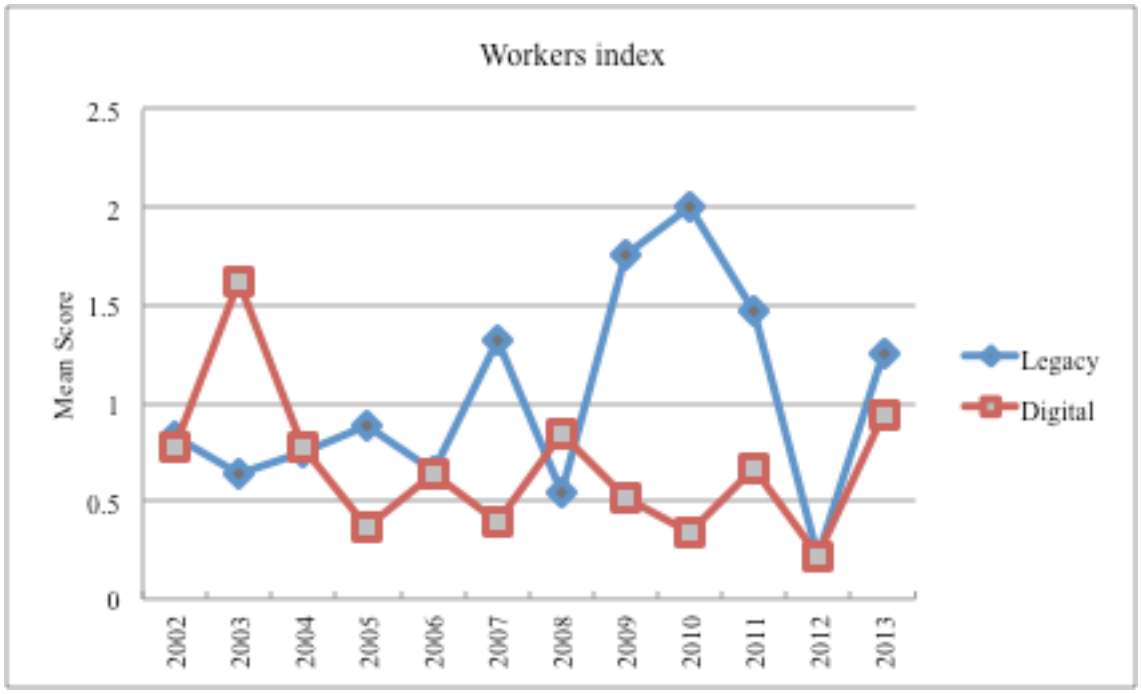


Figure 4.7. Workers index score means over time

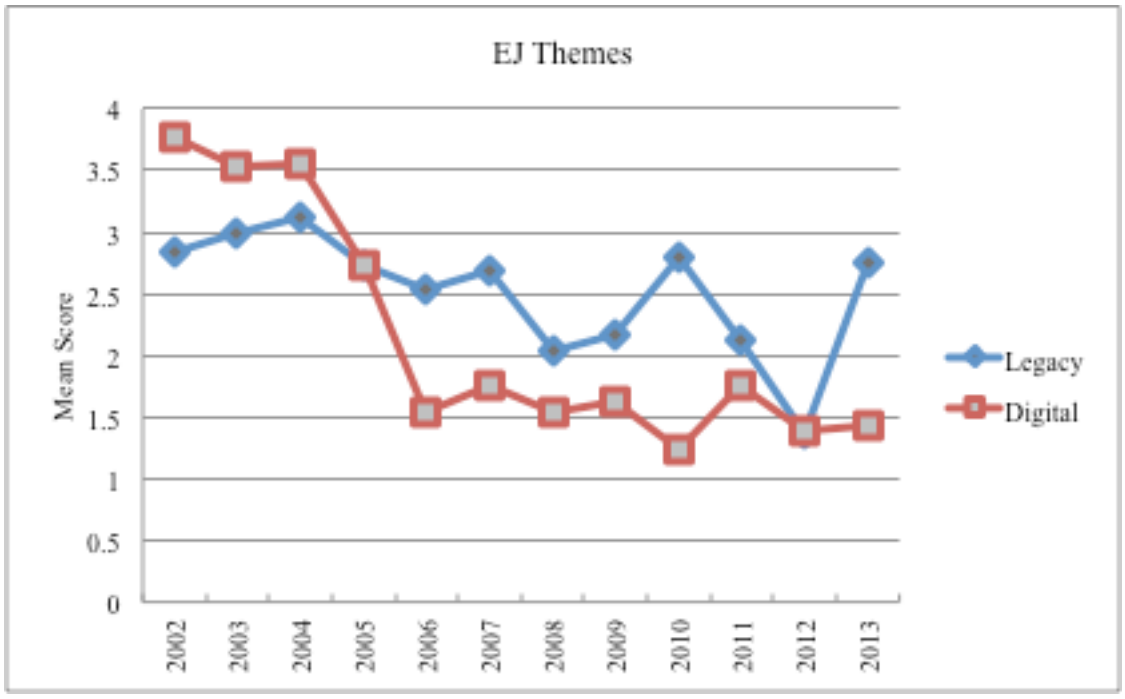


Figure 4.8. EJ Themes index score means over time

4.3.2. Topic Indexes and Other Topics

The topic indexes were examined in relation to coverage of two frequently used topics which were not included in the indexes–e-waste sector (seen in 51% of all articles) and consumerism (seen in 35% of all articles). The remaining topics not included in an index (product design, activism, reports, art projects, obsolescence, supply chains, and environmental crisis) were also examined using independent samples t-tests to see the difference between the mean scores in an index when a topic was or was not included. On this basis, the mean score for an index could be calculated for all the articles that included a specific topic. For example, did articles that discussed consumerism tend to score higher or lower on the Workers Index? After reviewing the findings from the e-waste sector and consumerism topics, I briefly explore some of the more pertinent findings of the topic associations within the indexes. I then discuss relationships between the topic indexes and sourcing patterns. Table 4.7 for EJ Themes and Table 4.8 for Workers index.

4.3.3. Indexes and E-Waste Sector

The e-waste sector topic was the top topic in the overall coverage–more articles in the study discussed e-waste sector issues than other topics. Articles that included the e-waste sector topic had a higher Workers index mean score (n=206, M=1.05) than articles that did not include e-waste sector topics (n=196, M = .51). Independent samples *t*-test revealed this difference to be statistically significant with a medium effect size, t(400) = 3.096, p = .002, d =-0.31. While there was not a statistically significant difference between the Workers index mean score by media type, legacy media had a higher Workers index mean score (*n* =103, M = 2.22, SD= 3.22) than digital media (*n* =103, M =

1.59, SD = 2.34) when the e-waste sector topic was included in articles.

The inclusion of the e-waste sector topic in articles was influential for the Workers index. When e-waste sector topics were included in articles, worker topics were covered more in articles than when the e-waste sector was not discussed. Furthermore, as Table 4.8 shows, independent samples *t*-tests found statistical significance when the index mean scores by media coverage types were tested separately. Digital media had a significant difference in its Workers index mean score when the e-waste sector topic was included, $t(223) = 3.584$, $p < .001$, $d = 0.47$. Legacy media as well showed slightly less, though still a statistically significant, difference in the Workers index score when the e-waste sector topic was included in legacy coverage, $t(175) = 2.28$, $p = .02$, $d = 0.35$.

In the overall coverage, articles that discussed the e-waste sector (M = 2.34, SD = 1.99) had a higher EJ Themes index mean than articles without e-waste sector topics (M = 1.84, SD = 1.5). Independent samples *t*-test found this difference to be statistically significant, with a medium effect size, $t(400) = 3.096$, p = .002, d =-0.31. As with the Workers index means, there was not a statistically significant result in the difference in mean EJ Themes index scores between legacy (M = 1.17, SE = 1.6) and digital (M = .93, SE = 1.21) articles that include e-waste sector topics, though legacy did include more EJ Themes coverage. When each media type was examined separately, the inclusion of the e-waste sector topic in the legacy media's EJ Themes coverage score means did not differ too much between legacy media that included e-waste sector coverage (n= 103, M= 2.55, SD = 2.03) and legacy articles that did not include e-waste sector topics (n = 74, M=2.12, SD = 1.63). Digital media covered EJ Themes more when articles also included e-waste sector topics (n=103, M = 2.14, SD = 1.92) than digital articles without e-waste sector

topics, (M = 1.69, SD = 1.40). This difference between the depth of EJ Themes coverage within the digital media was a statistically significant result with a small effect size, $t(223) = 2.018$, $p = .045$, $d = 0.26$.

4.3.4. Indexes and Consumerism

A little over one third of all articles covered issues related to consumerism. Results show that when consumerism was discussed, there was slightly less coverage of issues concerning workers. Articles that *did not* discuss consumerism ($n = 261$, M = .81, SD = 1.29) had a slightly higher Workers index mean score than articles that did include the consumerism topic ($n = 141$, M = .73, SD = 1.25). While this difference was not statistically significant, the independent samples *t*-test showed a significant difference between media types and the inclusion of the consumerism topic. Legacy media that included consumerism ($n = 60$, M = 1.10, SD =1.54) had higher Workers mean scores than digital media that discussed the consumerism topic ($n = 81$, M = .47, SD = .92), a statistically significant finding with a medium effect size, $t(139) = .3.031$, $p = 0.003$, d = 0.5.

There was not much difference in the overall EJ Themes mean score for articles that did include consumerism topics (M = 2.09, SE = 1.86) and articles that did not talk about consumerism (M = 2.15, SE = 1.75). However, when the articles are examined by media type, there were fairly large differences between the mean scores of the EJ Themes index. Legacy articles including the consumerism topic (n = 60, M = 2.88, SD = 2.10) scored almost double the EJ Themes index score than the digital articles which included consumerism (n = 81, M = .47, SD = .92). This difference between the mean index scores

was a statistically significant result with a large effect size, t(139) = 0.4.649, p < .001, d =0.8. This is an important finding because it shows that when digital media focused on consumerism, the strength/depth of coverage of EJ themes diminished. The consumerism topic impacted digital media's coverage of e-waste advocacy and environmental justice themes: When digital media discussed consumerism, the articles covered issues of environmental justice and advocacy less.

Table 4.7 EJ Themes index scores by media type and topic inclusion

	Legacy [a]				Digital [b]			
Topic	*n*	*M*	*SD*		*n*	*M*	*SD*	
E-waste sector	103	2.65	2.04		103	2.14	1.92	*
none	74	2.11	1.63		122	1.69	1.40	
Consumerism	60	2.88	2.10	*	81	1.51	1.42	**
none	117	2.19	1.74		144	2.11	1.76	
Product design	26	3.96	2.01	***	77	1.87	1.77	
none	151	2.16	1.74		148	1.91	1.62	
Supply chains	25	2.80	2.20		52	2.06	1.67	
none	152	2.36	1.84		173	1.84	1.67	
Anthropocene	28	1.79	2.27		41	1.61	1.58	
none	149	2.54	1.80		184	1.96	1.69	
Obsolescence	21	3.43	2.18	**	45	1.80	1.77	
none	156	2.29	1.81		180	1.92	1.65	
Activism	28	2.57	1.81		36	2.72	1.81	**
none	149	2.40	1.91		189	1.74	1.60	
Reports	19	3.68	1.57	**	38	2.34	1.86	
none	158	2.27	1.87		187	1.80	1.62	
Art projects	12	0.42	0.51	***	22	0.82	0.85	**
none	165	2.57	1.87		203	2.01	1.69	

Note. Independent samples t-test analyzed the differences between mean index scores within the media type when a topic was or was not included in articles. Topics listed in order of total percentage for all articles.
* $p < .05$, ** $p < .01$, *** $p < .001$
[a] n = 177. [b] n = 225.

Table 4.7. EJ Themes index mean scores by media type and topic inclusion

Table 4.8 Worker index scores by media type and topic inclusion

	Legacy [a]				Digital [b]			
Topic	*n*	*M*	*SD*		*n*	*M*	*SD*	
E-waste sector	103	1.17	1.57	*	103	0.93	1.21	***
none	74	0.66	1.25		122	0.42	0.93	
Consumerism	60	1.10	1.54		81	0.47	0.92	
none	117	0.88	1.43		144	0.76	1.18	
Product design	26	1.42	1.68		77	0.49	0.98	
none	151	0.87	1.42		148	0.74	1.15	
Supply chains	25	1.24	1.61		52	0.73	1.09	
none	152	0.91	1.44		173	0.63	1.11	
Anthropocene	28	1.25	1.73		41	0.49	1.00	
none	149	0.90	1.41		184	0.69	1.12	
Obsolescence	21	1.67	1.80	*	45	0.56	0.84	
none	156	0.86	1.39		180	0.68	1.16	
Activism	28	0.86	1.27		36	0.92	1.02	
none	149	0.97	1.50		189	0.60	1.11	
Reports	19	1.89	1.66	**	38	0.79	1.19	
none	158	0.84	1.40		187	0.63	1.08	
Art projects	12	0.33	0.78		22	0.27	0.63	
none	165	1.00	1.49		203	0.69	1.13	

Note. Independent samples t-test analyzed the differences between mean index scores within the media type when a topic was or was not included in articles. Topics listed in order of total percentage for all articles.
* $p < .05$, ** $p < .01$, *** $p < .001$
[a] n = 177. [b] n = 225.

Table 4.8. Worker index mean scores by media type and topic inclusion

4.3.5. Indexes and Activism, Reports and Art Projects

Aside from the e-waste sector and consumerism topics, some other findings about the topic indexes are important to highlight. The topics of activist reports, activism, and art projects impacted the coverage of workers and EJ themes to varying extents. When the topic of reports was included in articles, both topic index mean scores improved. This

is not too surprising, given that the content of the reports often contain the major frames and messaging strategies of the e-waste activists. The Workers index coverage had a slight increase when reports were included in articles, t(400) = 2.38, p = 0.018, d = 0.3. Articles that discussed reports had a mean Workers index score of 1.16, while those that did not include reports was .72 . Given that the Workers index score had a possible high score of 6 (six possible topics could be included in any one article) and only 5 articles in the study scored more than a four on the index, the mean Workers score was fairly low overall, reinforcing a major finding of this study: E-waste labor and disassembly issues were not covered very much during 12 years of news coverage by either media type. The reports topic also impacted the depth of coverage of EJ themes. Coverage that included the reports had a higher EJ Themes mean score than articles that did not include the report topic, t(400) = 3.053, p = .002, d = 0.4. This difference in mean scores was more pronounced in the legacy articles than in the digital articles, as Table 4.7 shows. The big takeaway is that coverage that included the activist reports, which activists used to publicize their research and draw attention to heroes and laggards, and other messaging strategies, increased the coverage of workers' and environmental justice concerns.

While there were similar patterns with the activism topic–coverage tended to have higher topic index scores when activism, including reports, was included–the difference in index scores was less when activism was included than when coverage included reports. The Workers index mean scores increased only slightly in both media types. The activism topic had more an effect on the EJ Themes index score means. When activism was included in coverage, there was more in-depth coverage of EJ themes, $t(400) = 2.603$, $p = .01$, $d = 0.4$. This result was statistically significant with a medium effect size.

This difference was seen more in the digital media than in the legacy coverage, which had only a small increase in mean score. Digital media that included the activism topic had higher EJ Themes scores than when activism was not included $t(223) = 3.325$, $p = .001$, $d = 0.57$.

The topic of e-waste art projects is in some ways a subset of activism, but was coded separately from activism because the topic became distinct enough–articles could focus on the design of a table or chair made from e-waste with minimal or no discussion of the environmental justice issues that advocates worked on. However, as the literature review discusses, scholarship recognizes the critical value in e-waste art projects to educate about the problems of e-waste. Thus it was surprising that when articles did include the art project topic, the mean scores of both indexes were reduced. The Workers index mean scores were lower when articles discussed art projects, a finding that was statistically significant with a medium effect size, $t(400) = 2.354$, $p= 0.019$, $d = -0.51$. The inclusion of the art projects topic had an even greater effect on the EJ Themes index, with the mean score more than double when articles did not discuss art projects, $t(400) = 5.098$, $p < .001$, $d = -1.14$. The finding does offer some possible avenues for future investigations into the what role the ascetics of waste has with activist-oriented art as well as some of the post/neo-colonial representational issues that articles covering e-waste art projects reflected–some of which will be examined in the next chapter.

4.3.6. Indexes and Product Design, Obsolescence, and Anthropocene

Art projects was not the only topic that decreased the depth of the coverage of workers and environmental justice issues. As mentioned earlier, the inclusion of the

consumerism topic in digital articles decreased both index means–digital media covered both indexes in more depth when consumerism was not discussed. But this was also seen with the product design, art projects, obsolescence, and Anthropocene[51] topics. When these topics were included in articles, digital media scored lower in both topic indexes. Product design and obsolescence are conceptually related; thus it is not too surprising that these topics might have similar effects. But it was surprising that the inclusion of the topics reduced the depth of coverage of the indexes within the digital media. When the obsolescence topic was included in coverage, digital articles had lower mean scores for both indexes. Index scores increased when obsolescence was not discussed in the digital media. The opposite was seen in the legacy media: Articles that included the obsolescence topic had more in-depth coverage of both indexes. Both the differences in the legacy media mean scores for the Workers index $t(175) = 2.404$, $p = 0.017$, $d = 0.50$ and the EJ Themes index, $t(175) = 2.638$, $p = .009$, $d = 0.57$, were statistically significant with medium effect sizes.

Product design had similar results. Index scores were lower in the digital media when product design was discussed while the scores were higher in the legacy media when product design was discussed. When digital articles discussed product design, they covered workers issues slightly less, while the legacy media covered workers issues more when articles discussed product design. While the digital mean scores for both indexes were only minimally different, the legacy media had more substantive differences. Both the Workers and EJ Themes mean index scores for legacy articles almost doubled when product design was discussed in articles. While the Workers index mean scores

[51] Anthropocene topic is also referred to as environmental crisis topic.

differences were not statistically significant, the EJ Themes index mean scores for Legacy articles were, with a large effect size, $t(175) = 4.758$, $p < .001$, $d = 0.96$.

Articles that included the topic of Anthropocene/environmental crisis also had less coverage on the Workers and EJ Themes indices. This result was also surprising–while Anthropocene and human caused/directed environmental problems were not a main e-waste activist frame, there are many overlaps with the environmental problems of CE/ICT, so I expected to see more articles that contextualized some of these problems. The Workers index was less affected by the inclusion of the topic, but the digital media did have lower mean scores for Workers index coverage, while the legacy media had higher scores. So legacy articles that discussed environmental crisis topics had more coverage of workers' issues, and digital media had less coverage of workers' issues, when climate change was included. These results were not statistically significant, but do merit attention as increasingly scholarship and social movements recognize that the divide between focusing on labor issues over environmental problems (and vice versa) has been unproductive. Furthermore, as research on industrial rhetorical around climate justice movements has shown, these tensions between labor and environmentalism continue to be used as a divisive communicative strategy by industrial neoliberal advocates (Klein, 2014; Schneider et al., 2016).

It is with the EJ Themes index that the inclusion of the environmental crisis had the most impact on the mean scores. Both media types had lower mean scores when articles included the climate change/environmental crisis topic. While the difference in mean scores within the media types was not large and was not statistically significant, the difference in the total overall was. When environmental crisis was included in articles,

the coverage of the EJ themes was reduced. The finding was statistically significant with a medium effect size, $t(400) = 2.288$, $p = 0..023$, $d = -0.3$.

4.4. Sources

Sources of quotes were coded for all articles and consisted of all statements that are attributed directly or indirectly to an actor. The source categories were analyzed as summaries and totals. Source summaries consist of counts of actor types per article, if at least one quote from an actor category was included anywhere in the article. Source totals are the total number of quotes, by actor type. Tables 4.9 [Source summaries by media type] and Table 4.10[Total sources used by media type] detail the descriptive information about each of the source/actor categories (referred to as sources from here on). Sources were also analyzed for prominence by examining text location–how many and how frequently sources were included in the top half of articles. The next section details for each source category the associations and differences between source type inclusion by the different media types and over time.

Table 4.9 Source summaries by media type: at least one quote by source

Source	Legacy [a]		Digital [b]				
	n	%	*n*	%	*p*	φ	χ2 (1)
Industry	82	46.3	102	45.3	0.92	-0.01	0.039
Activist	93	52.5	69	30.7	< .001	-0.221	19.705
E-waste sector	53	29.9	41	18.2	0.006	-0.137	7.597
Experts	55	31	69	30.7	0.93	-0.004	0.008
U.S. fed gov.	53	29.9	31	13.8	< .001	-0.197	15.663
U.S. state/local gov.	34	19.2	5	2.2	< .001	-0.285	32.631
Public	31	17.5	11	4.9	< .001	-0.205	16.878
Non-U.S. gov	15	8.4	8	3.6	0.05	-0.105	4.444
Transnational gov.	9	5.1	4	1.8	0.09	-0.093	3.462
Disassemblers	7	4	0	0	0.003	-0.15	9.05
Other [c]	5	2.8	2	0.9	0.14	-0.073	2.17
Combo: Gov. ANY [d]	88	49.7	46	20.4	< .001	-0.308	38.201
Combo: U.S. gov. [e]	73	41.2	34	15.1	0.005	-0.141	8.005
Combo: Non-U.S. gov.	20	11.3	12	5.3	0.03	-0.109	4.813

Note. Association between source type and media type as shown by Chi-Square analysis. All expected cell frequencies were greater than five. Sources are in order of source total mean for all articles. Totals of percentages are not 100 for every source because of rounding.

[a] $n = 177$. [b] $n = 225$.

[c] Due to low cell count the Other source category was dropped from subsequent tests except for overall sourcing counts and averages.

[d] Combination source category is total of US Federal, local and state government, non-US government, and transnational governance organizations.

[e] Combination source category is total of US Federal and state/local government sources.

[f] Combination source category is total of non-US government and transnational governance organizations.

Table 4.9. Source summaries by media type: at least one quote by source

Table 4.10 Total sources used by media type

	Legacy [a]		Digital [b]				95% CI		
Source	*M*	*SD*	*M*	*SD*	t(400)	*p*	*LL*	*UL*	Cohen's *d*
Industry	1.89	3.22	1.85	3.42	1.811	0.9	-0.61	0.70	0.01
Activist	1.95	2.71	0.96	1.95	4.297	<.001	0.54	1.46	0.42
E-waste sector	1.32	2.91	0.72	2.12	2.398	0.02	0.11	1.10	0.24
Experts	1.03	2.66	0.92	1.94	0.476	0.63	-0.34	0.56	0.05
U.S. fed gov.	0.77	1.69	0.45	1.81	1.811	0.07	-0.03	0.67	0.18
U.S. state/local gov.	0.75	2.09	0.04	0.32	4.985	<.001	0.43	0.98	0.47
Public	0.55	1.67	0.09	0.56	3.822	<.001	0.22	0.69	0.37
Non-U.S. gov	0.29	1.19	0.06	0.45	2.689	0.01	0.06	0.40	0.26
Transnational gov.	0.17	1.12	0.09	1.02	0.754	0.45	-0.13	0.29	0.07
Disassemblers	0.06	0.37	0.00	0.00	2.509	0.01	0.01	0.11	0.23
Combo: Gov. ANY	1.98	3.03	0.64	2.14	5.178	<.001	0.83	1.85	0.51
Combo: U.S. gov.	1.51	2.66	0.49	1.87	4.531	<.001	0.58	1.47	0.44
Combo: Non-U.S. gov.	0.46	1.69	0.15	1.11	2.227	0.03	0.04	0.59	0.22

Note. Sources are in order of source total mean for all articles. LL = lower limit, UL = upper limit.
[a] $n = 177$. [b] $n = 225$.

Table 4.10. Total sources used by media type

Table 4.11 Sources in top section of articles

	Legacy [a]				Digital [b]							
Source Type	*M*	*SD*	*n* [c]	%	*M*	*SD*	*n* [c]	%	χ2 (1)		*t*(400)	
Industry	0.37	0.85	38	21.5	0.63	1.08	78	34.7	8.41	**	-2.629	**
Activist	0.59	1.08	57	32.2	0.38	0.87	48	21.3	6.07	*	2.207	*
E-waste sector	0.24	0.67	28	15.8	0.19	0.68	20	8.9	4.53	*	0.833	
Experts	0.2	0.64	21	11.9	0.39	1.04	43	19.1	3.89	*	-2.118	*
U.S. fed gov.	0.25	0.72	27	15.3	0.21	0.77	26	11.6	1.18		0.542	
U.S. state/local gov.	0.23	0.93	18	10.2	0.02	0.18	4	1.8	13.49	***	3.208	***
Public	0.14	0.47	17	9.6	0.02	0.18	4	1.8	12.26	***	3.341	***
Non-U.S. gov	0.08	0.54	6	3.4	0.04	0.36	6	2.7	0.18		0.89	
Transnational gov.	0.08	0.57	5	2.8	0.05	0.52	4	1.8	0.50		0.578	
Disassemblers	0.01	0.08	1	0.6	0.00	0.00	0	0.0	1.27		1.128	

Note. Sources are in order of source mean score for all articles. Association between source type and media type as shown by Chi-Square analysis. All expected cell frequencies were greater than five. Totals of percentages are not 100 for every source because of rounding. Independent samples t-test analyzed the differences between the source mean and media type.

[a] $n = 177$. [b] $n = 225$.

[c] = Counts of articles with at least one source in section one.

* $p < .05$. ** $p < .01$. *** $p < .001$.

Table 4.11. Sources in top section of articles

4.4.1. Industry Sources

The industry source category reflects quotes from corporations and industrial organizations not specifically mentioned as e-waste actors. Industry sources came from the full life cycle phases of electronics manufacturing, so companies involved in making, producing, designing, and selling electronics are included, but companies that just focus on e-waste, electronics recycling, or used electronics are not (these are coded as e-waste sector). Industry sources were used at similar amounts between media types. Both legacy and digital media used at least one industry quote in about 45% of articles. Industry source totals also reflected similar amounts of reliance upon industry quotes as there was little difference between media types in the mean scores. However, there was a statistically significant difference between the media types' use of industry quotes in the top section of articles. Almost 35% of digital media articles included industry sources in the top section of articles, while slightly less than 20% of legacy media articles did. The mean score of industry sources used in the top half of articles differed significantly between the digital media (M = .63), which used industry sources more in the top section of articles at twice the amount then the legacy media (M = .37,), $t(400) = -2.629$, p =.009, d = -.27.

4.4.2. E-waste Activists

The activist source category reflected both terms and included generic references to advocates or activists for e-waste, environmental justice, or environmentalism (e.g. environmentalist). Even though 40% of all articles included at least one activist source, almost 70% percent of the digital media articles included no activist sources. The total

use of activist quotes also differed significantly between media types. Legacy media used almost double the activist quotes in articles compared to digital media. Legacy coverage used an average of almost two activist quotes per article ($M = 1.95$) while the digital media used almost one activist source per article ($M = .96$). This important difference in source patterns between media types, $t(400) = 4.297$, $p < .001$, $d = .42$, was also seen when activist sources were used in the top section of articles. The mean score for activist quotes in the top section of legacy articles ($M = .59$) was slightly greater than digital media, ($M = .38$), $t(400) = 2.207$, $p = .028$, $d = .21$.

While both digital and legacy media included similar amounts of industry quotes in coverage in the early period, digital media quickly shifted to include higher amounts of quotes per article after 2003, while legacy decreased the use of industry quotes. However, starting in 2006, legacy had returned to similar average quotes by industry actors (slightly more than the digital media on average between 2006 and 2007) while the later period of coverage both media types included similar amounts of industry quotes per article. This pattern was reversed for the average quotes by activists in articles. The first two years of coverage, both media types included activists quotes at similar amounts; at the beginning of the coverage, about 2.5 activist quotes per article were included in articles during this time period.

4.4.3. E-Waste Sector, Disassemblers and Experts

The e-waste sector source category included any company or organization that works in electronics recycling sector. This also includes organizations that collect electronics to be recycled (like Green ATM, Goodwill, Habitat for Humanity). Press

statements or releases that are attributed to these organizations were also coded as this source category. Quotes could be from company officials and spokespersons, plant managers, industry groups, electronics recycling trade associations, or lobbying groups. Media coverage included an e-waste sector source in almost 25% of all articles. In the beginning of the issue cycle, both legacy and digital media included an average of about one e-waste sector source per article. As time continued, the legacy media increased the number of quotes per article by e-waste sector actors, while digital coverage reduced their inclusion of e-waste sector actors until 2008, at which point digital media began to increase their use of e-waste sector quotes. By 2010 and 2011, both media types were using an average of about 1.3 e-waste sector quotes per article. However, after 2011, the digital media began reducing their inclusion of e-waste sector actors, while legacy media continued to increase their use of e-waste sector actors. Overall digital media used fewer e-waste sector quotes on average per article, (M = .72), than legacy media (M = 1.32). Both media types used e-waste sector quotes at similar amounts in the top section of articles, with the legacy media using slightly more quotes by e-waste sector actors per article (M = .24) than digital media, (M = .19).

This e-waste sector source category did not include e-waste workers, who, when quoted, were included in the dissembler category. This source category included laborers/actors who work in e-waste recycling plants, factories, formal and informal disposal sites, and e-waste processing areas. They could be described as pickers, recyclers, dissemblers, or workers, but if a title was used that indicated the actor was an owner, manager, or executive of an e-waste business, than the e-waste sector category was used.

The health and safety of the workers who dispose and recycle electronics in all areas of e-waste disposal (informal and formal) is an important issue of e-waste. Thus it is disappointing that the e-waste workers and disassemblers were not frequently, if at all, used as sources. In less than 2% of all articles was a least one worker quoted. Even more significantly, digital media never quoted a disassembler in 12 years of coverage, while only 4% of legacy articles included at least one disassembler quote, (χ^2 (1) = 9.056, p = .003). Given digital media's failure to include any quotes from disassemblers, it is not surprising that there were significant differences between the average use of disassembler quotes by media type. Legacy's inclusion of disassemblers quotes per article (M = .06) was only slightly more than digital media's total absence of disassembler quotes. Out of all articles, only one legacy article in 12 years included a dissembler quote in the top half of the article.

Experts were the fourth most quoted source category in all coverage. The category of "experts" included academics, market researchers (such as Forrester or Gartner research), and journalistic sources. Slightly more than 30% of all articles included at least one expert quote. The percentage of articles using experts as sources was similar between media types. While the use of expert sources did not differ much in average quotes per articles, the media types did use experts differently in the top section of articles, with digital media using slightly more expert quotes on average (M = .39) in the top section than legacy media (M = .20).

Experts and e-waste sector sources had similar overall mean scores–an average of .99 e-waste sector quotes and an average of .97 expert quotes were included in coverage. However, the expert sources were used in more articles than e-waste sector

actors. So articles that included e-waste sector actors quoted those actors more frequently in an article, but experts were used in more articles overall–30.8% of all articles included at least one expert quote, while 23.4% of all articles include at least one e-waste sector quote.

4.4.4. Government and Public

Issues of policy and legislation figured prominently in e-waste coverage. One of the many problems with e-waste is the absence of a national policy for electronics disposal and recycling. In the United States, activists approached the problem at the state and local government level in order to spur some action and regulation over e-waste disposal. Furthermore, e-waste is a transnational issue, particularly in terms of international treaties and policies related to toxic dumping (like the Basel Ban). Given the role that policy and policy making have played within e-waste advocacy and environmental justice activism generally, the use of government sources in the coverage revealed some surprising results.

Government sources were coded initially in four categories based on the level and geography of governance. In total, a third of all articles included at least one quote from any type of government source. Nearly twice the amount of legacy articles included government sources as did digital articles, (χ^2 (1) = 38.201, p = .000). The number of average government sources used per article differed significantly between media types, with legacy articles including government sources at almost three times the amount of digital media, t(303.927) = 4.973, p < .001. Results show that e-waste coverage prioritized U.S. federal government sources over U.S. state or local government sources

and international or transnational government sources.

Twenty percent of all articles included U.S. federal government sources, while less than 10% of coverage included U.S. state or local government sources. Legacy media used more U.S. federal government sources per article on average. In terms of how many articles used at least one federal government quote, there was a significant difference between media types, with 63% of all articles that had a U.S. federal government quote coming from the legacy media, (χ^2 (1) = 15.663, p = .000).

Government sources from local and state governments were underrepresented in overall coverage, but particularly in the digital media. Almost all digital articles (97.8%) did not include any quotes from state or local government sources. Legacy media included these sources slightly more often, showing a statistically significant association between media type and inclusion of state and local government sources, (χ^2(1) = 32.631, p < .001).

When these U.S.-based government source categories were combined to explore how U.S. government sources appeared in coverage overall, the differences between digital and legacy media's use of U.S. government sources are even more pronounced, (χ^2 (1) = 34.635, p < .001). Legacy coverage included more than three times the amount of U.S. government sources per article (M = 1.51) compared to digital media (M = .49). Thirty percent of legacy articles included U.S. government sources in the top half of articles while 17% of digital articles did, (χ^2 (1 = 8.005, p = .005). Legacy used more US government quotes in the top section of articles (M = .48, SD = 1.19) compared to digital media (M = .23, SD = .79), t(291.781) = 2.352, p = .019.

When coverage began both legacy and digital media included an average of about

one U.S. government combination source. However, digital media's use of U.S. government sources dropped substantially– between 2006 and 2007 digital media used an average of .05 quotes by U.S. government sources (federal, state, or local), while during the same time period legacy media increased their use of U.S. government sources. Between 2006 and 2007, when digital media barely included U.S. government sources, legacy articles included an average of 1.87 quotes by U.S. government sources. Legacy media reduced the number of quotes by US government sources after 2007, but the overall use of US government sources remained higher than digital media, even as digital media slightly increased their inclusion of U.S. government sources in the later period.

Though this study investigated United States-based media outlets, due to the international nature of e-waste issues, the underwhelming use of non-U.S. government sources was also surprising. Nearly 95% (94.3%) of all coverage did not include at least one quote from non-U.S. government sources, with legacy media including non-U.S. government sources slightly more articles than digital outlets, (χ^2 (1) = 4.444, p = .050). Though few non-government sources were used by either media type, there were significant differences between the average numbers of quotes by non- U.S. government sources. Given legacy media's use of U.S. government sources, it is probably not surprising that legacy's average of non- U.S. government sources per article (M = .29, SD = 1.11) was also higher than digital media's average (M = .06, SD = .45), t(215.560) = 2.457, p = .015, as legacy media used all types of government sources substantially more than the digital media.

Transnational government institutions (TGI) sources were used even less than non- U.S. government sources. TGI sources were representatives, spokespeople, or

elected officials from transnational governance organizations and institutions that work with two or more nations in policy issues. Legacy media used slightly more quotes by TGI sources than the digital media. A combination source category of both the non- U.S. government sources and transnational government institutions showed a similar pattern of absence of international sources within the coverage and between the media types, ($t(289.968) = 2.124$, $p = .035$. Overall, 92% of all articles contained no government sources from countries other the United States.

In the non- U.S. government combination source category (sources from non-U.S. governments and transnational government institutions), digital media used even less quotes than they did with the U.S. government category. Both legacy and digital media began coverage with a practical absence of international government sources. Over time, the inclusion of more quotes per article by non- U.S. government sources increased for both media types. Between 2010 and 2011, inclusion of these sources peaked, when legacy media included an average of 1.5 quotes per article by non-US government sources and digital media included .42 quotes on average. Coverage of the UN report during this time period likely increased the inclusion of non- U.S. government sources in coverage.

Finally, while a little more than 10% of all articles included at least one public quote, the use of public sources differed between media type, with more legacy articles including quotes from the public source category than digital articles, ($\chi^2(1) = 16.878$, $p < .001$). The public included references to citizens, residents, neighbors and Non-Governmental Organizations (NGOs) not specified as e-waste activism or environmental activism (these organizations could be based in the United States or internationally).

Legacy media used public sources more frequently than the digital media, in total mean scores for the source category and in using public sources in the first section of articles.

The inclusion of public source quotes was similar between media types at the beginning of coverage time period, though overtime public quotes were included in more legacy articles than digital. While the first few years there were barely any quotes from public sources (the overall average between 2002 and 2003 was .13 quotes by a public actor per article), between 2004-2005 legacy media coverage increased the use of public quotes while digital media decreased their already very low inclusion of these sources. Digital media continued to rarely include public sources throughout the rest of the time periods, though between 2010 and 2011 there was a slight increase in the use of public quotes, similar to digital media's slight increase of non-U.S. government sources during this same time period. Legacy media continued to include public quotes at a greater rates throughout, but unlike the digital media, decreased their use of public quotes during 2010 and 2011. By the end of the coverage period, digital media barely included public quotes while legacy had increased their inclusion.

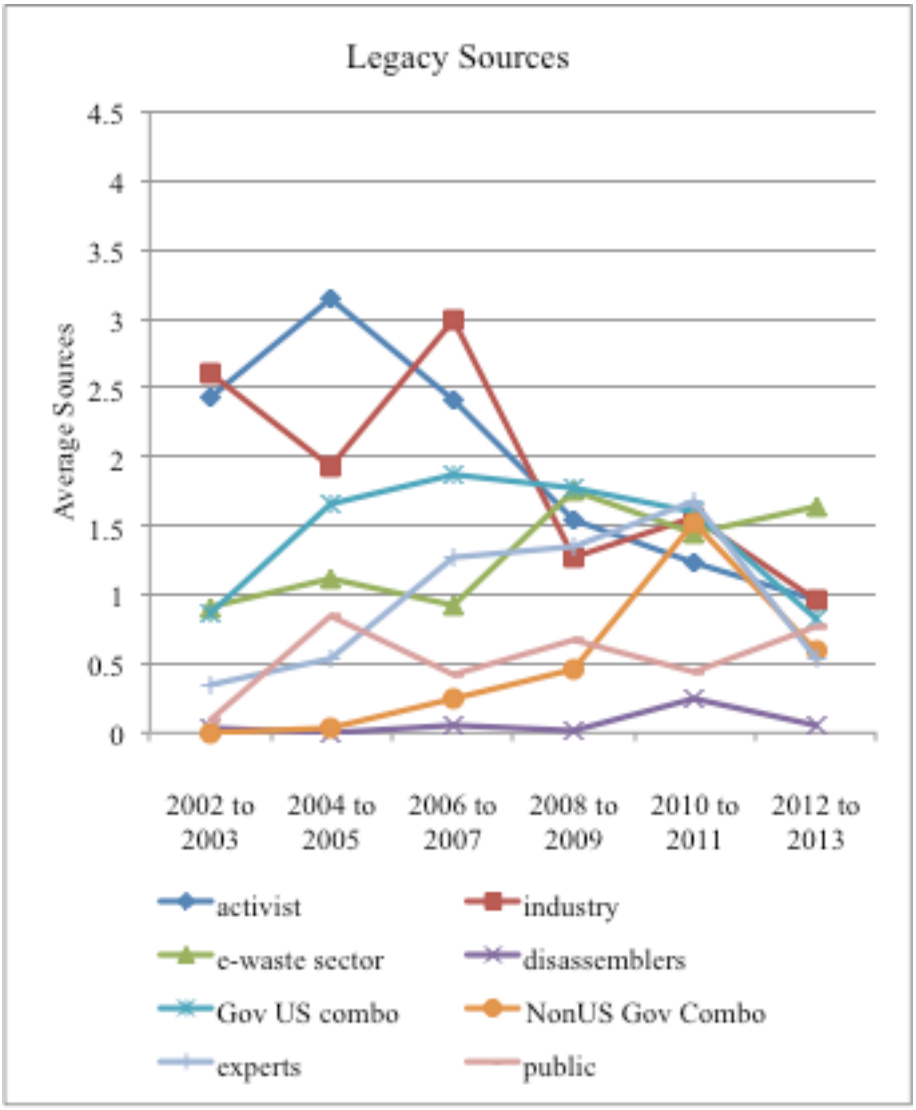


Figure 4.9. Legacy sources averages over time

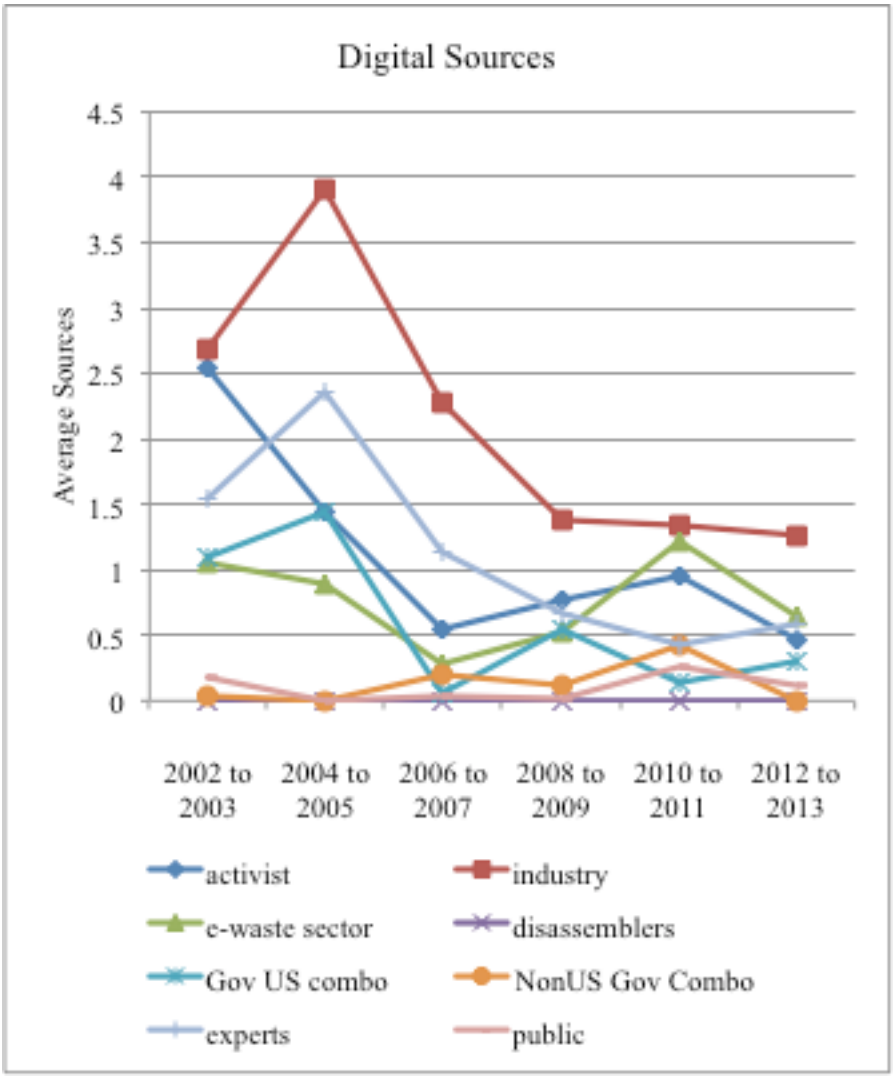


Figure 4.10. Digital sources averages over time

4.5. Topic Indexes and Sources

A Spearman's rank-order correlation showed that there was a moderate positive correlation between articles that scored higher on the Workers index and higher on the EJ Themes index, $r_s(400) = .554$, $p < .001$. Articles that scored high on one index tended to score high on the other index–even though the indexes were testing different topics.

Generally when a source category was included in articles, the scores of the topic indexes increased. The only exception to this was when US state and local government sources were included in articles, the Workers index score decreased slightly. The inclusion of all source categories except for industry, experts, and U.S. state/local government sources improved the mean score for the Workers index. Articles with activists quoted tended to have more coverage of workers' issues–the Workers index mean score more than doubled, $t(400) = -6.565$, $p < .001$, $d = 0.63$. The inclusion of e-waste sector sources also doubled the overall mean score, $t(400) = -4.633$, $p < .001$, $d = 0.50$. Articles with at least one source from the U.S. federal government, non- U.S. governments, and transnational governance institutions also had higher mean scores for the Workers index. Most striking of all of the source categories is the inclusion of disassemblers: When articles quoted disassemblers, the Workers index mean score increased substantially, from a mean score of less than one (.74) to a mean score of 3.3, $t(400) = -5.389$, $p < .001$, $d = 1.94$.

The EJ Themes index had similar differences in mean scores with the inclusion of activist sources, $t(400) = -10.903$, $p < .001$, $d = 1.08$, e-waste sector sources, $t(400) = -5.614$, $p < .001$, $d = .62$ and U.S. federal government sources, $t(400) = -8.347$, $p < .001$, $d = .95$. But it is the inclusion of the disassemblers source category that changes the overall EJ Themes mean score most significantly. Articles with at least one quote from a disassembler had a mean EJ Themes index score of 4.6 compared to articles without a quote from disassemblers which had a mean EJ themes score of 2, $t(400) = -3.709$, $p < .001$, $d = 1.62$. Table 4.12 details further information about mean scores and source inclusion.

Table 4.12 Topic index means and source summaries

	Workers Index				EJ Themes Index			
	n [a]	*M*	*SD*		*n* [a]	*M*	*SD*	
Source								
Industry	184	0.82	1.29		184	2.52	1.86	***
No industry	218	0.76	1.27		218	1.80	1.65	
Activist	162	1.27	1.55	***	162	3.17	1.79	***
No activist	240	0.46	0.93		240	1.43	1.40	
E-waste sector	94	1.31	1.56	***	94	3.00	2.05	***
No e-waste sector	308	0.63	1.14		308	1.86	1.61	
Experts	124	0.94	1.31		124	2.34	1.90	
No experts	278	0.72	1.26		278	2.03	1.73	
U.S. fed gov.	84	1.43	1.70	***	84	3.46	1.98	***
No U.S. fed gov.	318	0.62	1.09		318	1.77	1.55	
U.S. state/local gov.	39	0.64	1.16		39	2.90	1.90	**
No U.S. state/local gov	363	0.80	1.29		363	2.04	1.76	
Public	42	1.21	1.57	*	42	2.64	2.16	*
No public	360	0.74	1.24		360	2.07	1.73	
Non-U.S. gov	23	1.52	1.65	**	23	2.52	2.06	
No Non-U.S gov	379	0.74	1.24		379	2.10	1.77	
Transnational gov.	13	2.00	1.78	***	13	3.08	1.71	
No Transnational gov.	389	0.75	1.24		389	2.10	1.78	
Disassemblers	7	3.29	1.38	***	7	4.57	1.27	***
No disassemblers	395	0.74	1.24		395	2.08	1.77	

Note. Sources are in order of source mean score for all articles.

[a] *Counts of articles with at least one source from source category or not.*

* $p < .05$. ** $p < .01$. *** $p < .001$.

Table 4.12. Topic index means and source summaries

4.6. Devices

Articles were coded as having a device mention if the device category was discussed in terms of disposal or end-of-life issues. For example, for the computer device category, it was not just mentions of computers anywhere in the article: the mention had to be about recycling computers or problems with disposal because of toxins in computers (see codebook, Appendix B for full description). So rather than a key word count of how many devices were included in articles, this coding category tries to get at what types of devices were included in the conversation about the problems of e-waste. While this study is focused on consumer electronics, the problems of e-waste are much larger than individuals properly disposing of their mobile phones.

Increasingly e-waste is categorized into six categories: heating and cooling equipment, screens/monitors, lamps, large equipment, small equipment, small IT (phones, printers, etc). However, because this study examined the narratives of e-waste as these categories and the more formal sector of disposal were settling into shape, I was more interested in how the devices were talked about. The EPA historically has considered e-waste through the "category of 'selected consumer electronics,'" which does not reflect the broader EU definitions that include items like toasters and electric toys as well as large appliances like refrigerators (Renckens, 2008, p. 286). Rather than lump all consumer electronics into two categories–screens and small IT–I thought it better to examine in more detail what media coverage called e-waste. So even though the heating and cooling category of waste is a really significant category in terms of weight and tonnage of waste, a mention of a refrigerator would have been coded as an appliance rather than the more narrow subcategory.

Table 4.13 Devices by media type

	Legacy		Digital		
Device	*n*	%	*n*	%	
Computers	124	70.1	154	68.4	
TV	66	37.3	37	16.4	***
Phones	54	30.5	81	36.0	
AVI [a]	41	23.2	36	16.0	
Video games	5	2.8	14	6.2	
Other [b]	11	6.2	7	3.1	
Appliances	7	4.0	8	3.6	

Note. Association between device type and media type as shown by Chi-Square analysis. All expected cell frequencies were greater than five. Devices are in order of total percentage for all articles. Totals of percentages are not 100 for every source because of rounding.
[a] Audio, video, and imaging equipment.
[b] Included batteries, xmas lights, carpets, e-cigarettes, and ships.
* $p < .05$. ** $p < .01$. *** $p < .001$.

As Table 4.13 shows, coverage of e-waste often included computers as part of the discussion. Over the entire coverage period, computers were in almost 70% of articles. The remaining device categories like phones, televisions, and audio/video equipment were also included in coverage, but at lower percentages. Video games, appliances, and the other category combined were in less than 15% of all articles. The other category allowed for data collection on items that did not fall into the device categories. The majority of other device mentions were batteries–car batteries or small household batteries (AAA, rechargeable). If batteries were discussed in the context of a device, like a mobile phone battery or laptop, then the device that the battery was part of was coded to that category. Batteries not discussed in combination with specific devices were included in the other category, as were lighting materials like holiday lights or CF bulbs.

Miscellaneous electronic items like smart textiles and e-cigs constituted the remaining other devices.[52] Coverage overall included an average of 1.6 device categories in articles. When "average device mentions" is compared between media types, the legacy media included slightly more devices (M = 1.22, SD = .09) compared to the digital media, (M = 1.15, SD = .08), $t(400)$= 2.034, p = *.043,* d = .84, 95% CI [.01, .84].

The overall inclusion of most of the device categories was similar between media types. The television category was different between the media types. Legacy included television more often than digital media, a statistically significant association, (φ = - .237, $\chi^2(1) = 22.585$, $p < .001$). However, when the device categories are examined within the media types coverage during different time periods of the coverage, more differences arise. Figures 4.11, 4.12, 4.13, and 4.14 shows the change over time of device category inclusion by media type. Between 2002 and 2005, 90% of digital articles included the computer category, but the inclusion of this category dropped to around 60% of digital articles for the remaining eight years. Alternatively, early digital media coverage did not include the phone category very much; for example, only 10% of articles include phones from 2004–2005, but by the later coverage period, phones are in over half of all digital articles. While 80% of legacy articles included the computer category in early coverage, later coverage showed, similarly to the digital media, that the inclusion of the computer category in legacy had decreased. Video games had a slightly different pattern, where the early coverage of both media types had fewer inclusions of video games, but during the middle years, the legacy media increased mentions of video games, followed shortly after by the digital media increasing their coverage. The television category showed the most

[52] Ships were only mentioned in one article. E-waste activism also includes shipbreaking as the process is covered under the Basel Treaty/Ban (Baynham, 2008).

difference between the trajectory over time: While both media types included televisions around similar amounts (in terms of percent of articles), digital media dropped coverage of televisions through 2007 while legacy media increased coverage. As the later period began, legacy media reduced coverage of televisions while digital media increased. Both media covered televisions at similar amounts by 2010-2011, shortly after the digital television transition became federally mandated by the FCC in June 2009.

Though the how-to section of articles did not appear too much overall, how-to-sections were places in articles that informed readers about where/how to recycle their electronics. When articles did include the educational/informational component of the how-to section, 68% included computers, 27% televisions, 48% phones, and 32% AVI. Less than five percent of articles with how-to sections included video games, and no articles that had a how-to section included appliances.

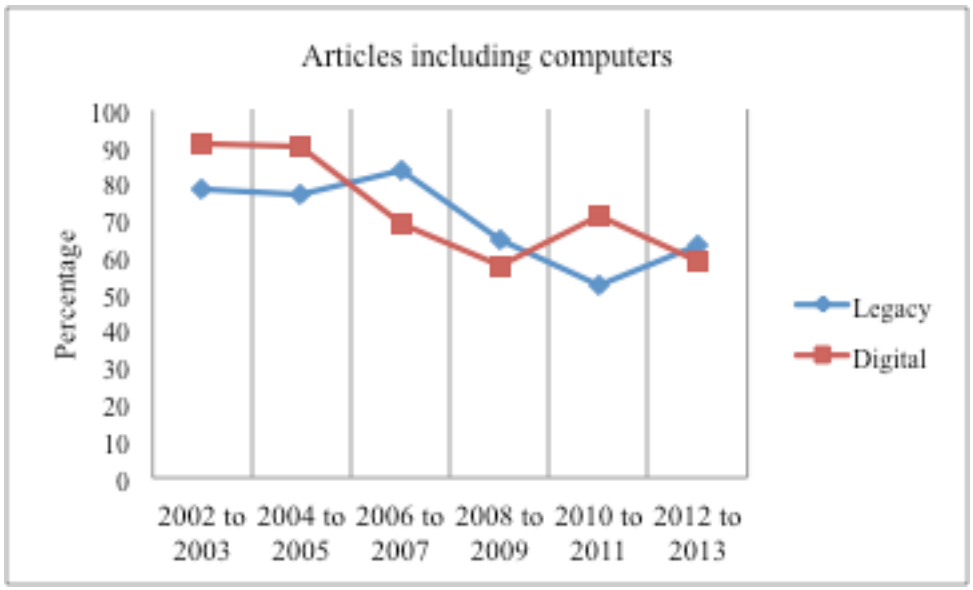


Figure 4.11 Percent of articles with computers over time

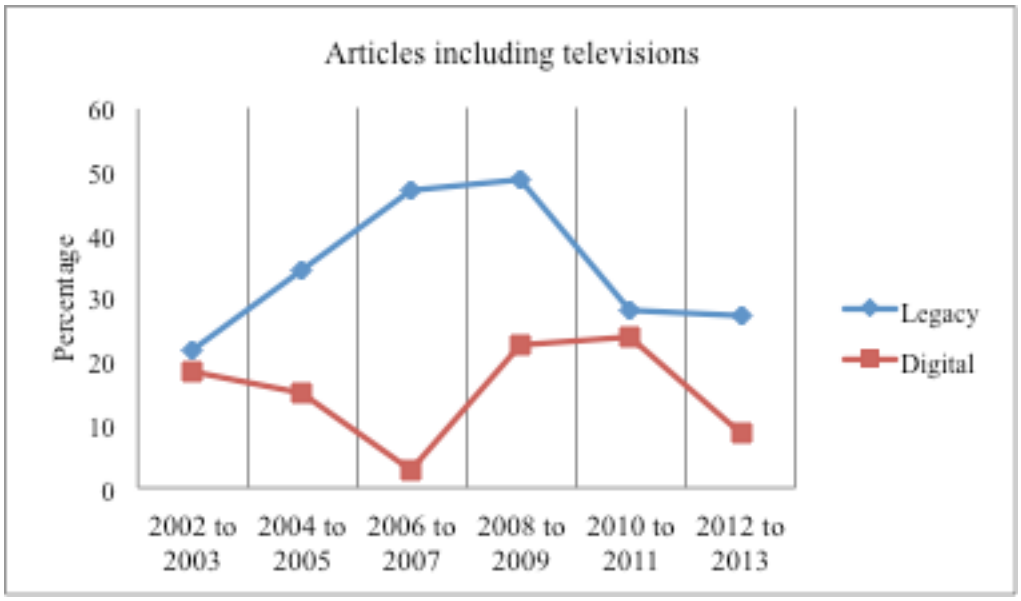


Figure 4.12 Percent of articles with televisions over time

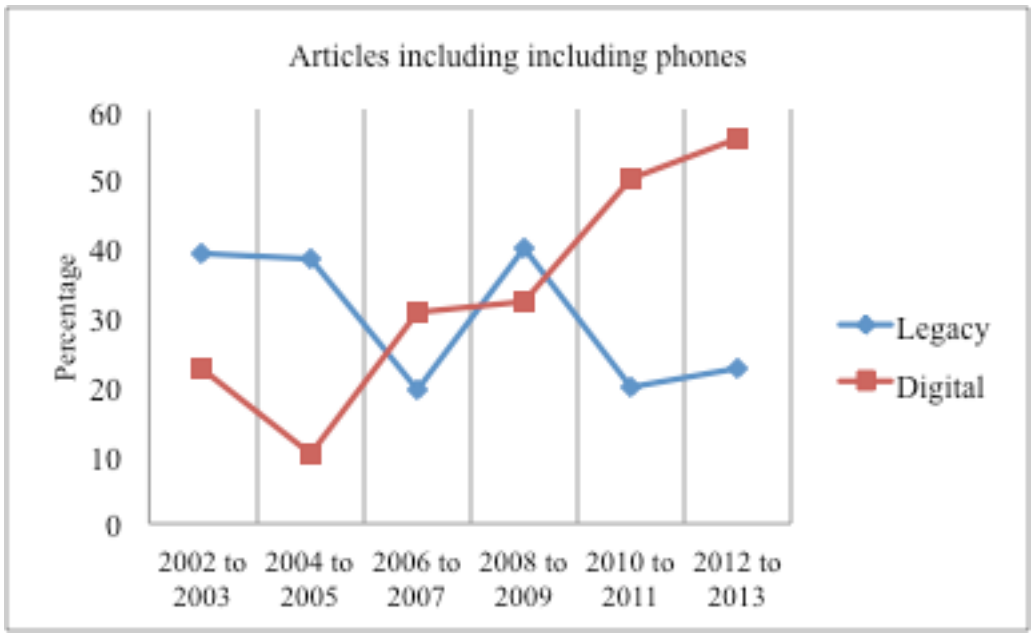


Figure 4.13 Percent of articles with phones over time

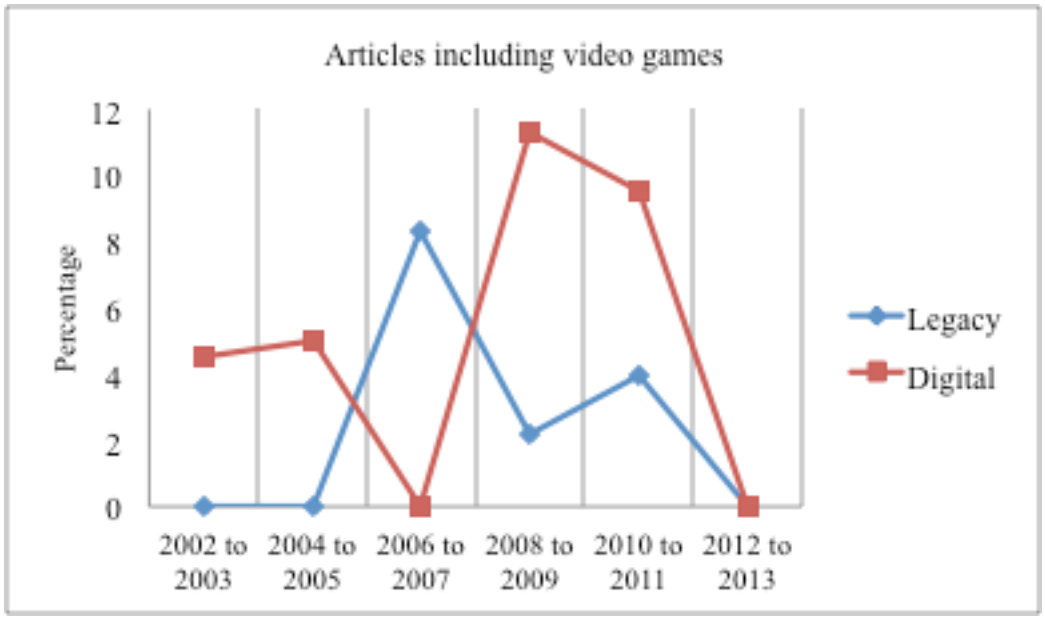


Figure 4.14 Percent of articles with video games over time

4.7. Coverage Summary

The e-waste activist network sought to raise attention to the harmful materials in electronics, to the fact that e-waste amounts were growing at extreme rates and that this waste was toxic. E-waste was also a risk to security and privacy. Furthermore, the activists wanted to inspire changes in legislative policies and corporate practice while also raising attention about mass consumption and changing policies that allowed prison labor for e-waste disposal. Environmental justice was the master frame of these ideas, linking exploitation and inequitable burdens of toxic pollution to marginalized populations. Some of these ideas received more attention over the 12-year period, and all did not receive extensive coverage. Of all the topics examined in this study, only one topic was in more than 50% of articles–the e-waste sector. Legislative issues were in slightly more than 40% of articles overall. E-waste activist concerns about harmful and toxic materials in electronics, the growth of e-waste and the idea that e-waste is toxic

waste were in almost a third of all articles, while prison labor and data and security concerns were in less than 10% of articles. Legacy media covered the environmental justice concerns more comprehensively than digital media, while all media coverage rarely address workers issues.

The early period of the issue cycle covered environmental justice topics in more depth than the later coverage. While only 20% of articles did not include any topics on the environmental justice index, only a third of all article discussed workers' topics. On the one hand, the environmental justice index tested more topics, and thus there was a greater likelihood that an article would discuss one of the nine topics. On the other hand, workers' topics seemed to overlap with some of the key topics within the environmental justice index–like that e-waste is toxic waste, or that disassemblers in the global south bore the bulk of the toxic waste and thus labored in unjust conditions.

This chapter has reviewed findings from the content analysis, focusing on examining how the media story of electronic waste changed over time and how legacy and digital media coverage compared. Through examining the topic indexes of workers' issues and environmental justice themes, the content analysis also worked towards examining more broadly how the coverage reflected environmental justice issues and what gaps and absences existed. Chapter five will continue this exploration of environmental justice and assess in more detail how sustainable capitalism themes were contained throughout coverage.

CHAPTER V

ENVIRONMENTAL JUSTICE AND SUSTAINING CAPITALISM

This chapter uses document analysis to explore how media coverage of electronic waste reflected environmental justice or sustainable capitalism perspectives; the chapter is organized between these two concepts. First I discuss themes and patterns in coverage that connect to environmental justice: *activism* and *labor rights* are the organizing concepts for this section. Within each concept I look at how social and environmental issues were represented and I explore how environmental activism and digital inequalities were portrayed.

In the second part of the chapter, I discuss themes and patterns in coverage that connect to sustainable capitalism. The organizing concepts for this section are *sustaining capitalism* and *consuming justice*; I use these concepts to continue to examine social and environmental issues and examine how coverage addressed consumerism. Throughout the chapter I continue my discussions and observations from chapter four regarding patterns of coverage over the 12 years and differences between legacy and digital media outlets, though this chapter primarily works towards answering the second set of the project's research questions:

RQ1. How does the media story of electronic waste change over time?

> RQ1a. What differences exist between legacy and digital media coverage about electronic waste?

RQ2: To what extent did legacy and digital media news coverage of electronic waste reflect environmental justice or sustainable capitalism perspectives?

> RQ2a: What social and environmental justice issues are present and absent in the coverage of electronic waste? How did media coverage of electronic waste portray environmental activism?

RQ2b: How were issues of digital inequalities and consumerism discussed in the coverage of electronic waste?

5.1. Environmental Justice: Activism

In addition to educating the public about the environmental justice problems with e-waste, the e-waste activist network sought two primary goals: improving corporate responsibility for products, a weakened form of extended producer responsibility (EPR), or individual producer responsibility, and policy changes like state and federal laws prohibiting e-waste export and pollution (Edge, 2011; Raphael & Smith, 2016). While activists did not dominate coverage or have much control over articles' content, they were able to insert critiques through quotes and press coverage of their investigations and reports. However, just getting quoted in an article does not necessarily mean your intended message was included, and as this section reviews, the portrayals of activism helped to reduce activists to angry, less legitimate and unrealistic actors in e-waste issues. While activist reports were an important component of the e-waste story, coverage decontextualized social movement organizing and political action surrounding e-waste. Though the moral drama approach to e-waste framing was essential to many of the activist reports, coverage at points was outright hostile towards activists, in some respects turning a heroes/villains frame onto the activists, especially Greenpeace. Activism was often erased by coverage that would attribute change in e-waste policies to corporate benevolence or decontextualized outcomes of activism and public pressure. After reviewing in more detail the patterns of portrayals of activism, the remainder of this section discusses how media coverage dealt with e-waste policy and regulations. One of the key policy events that occurred during the 12 years of coverage was the federally

mandated digital television transition in 2009. I explore in more detail how activist messaging and campaigns about the digital transition and television takeback programs were covered. The final discussion of this section looks at connections between e-waste policies and digital inequalities and reviews the e-waste activist network's investigations about delayed dumping and the different types and locations of e-waste disassembly.

5.1.1. Describing Activism

There was no consistent way to describe e-waste activist actors. What is the difference between a "recycling activist" and an "environmental activist"?[1] Why are environmentalists not activists? *USA Today* identified the actors as different: "Environmentalists and activists want Congress to make exporting such e-waste illegal."[2] *The Washington Post* also hinted at a difference by calling a recycler a "reuse advocate" as opposed to an environmentalist or activist.[3] This article in 2005 was written by Elizabeth Grossman, author of *High Tech Trash: Digital Devices, Hidden Toxics, and Human Health*, perhaps showing that journalists who specialize in issues of garbage and environment may have more nuanced definitions of the actors and issues. While there was no consistent way to define the e-waste activist network actors, the differing ways to classify the actors also affected the descriptions of their actions and statements. For example, a *CNET* article uses different verbs to describe the actions

> of a coalition that wants to see all electronics makers become involved in the disposal of the products they've made and sold. … But environmentalists for years have warned of the potentially toxic effect of those ingredients when the products become scrap and are incinerated or dumped into landfills.[4]

The action of the actor changes depending on if it is activist/environmentalists, who

warn, or more generally, a coalition, who *wants*.

Verb choice in articles helped minimize agency and legitimacy of activists while encouraging the conflict pattern between activists and industry. For example, activists *contend* and *complain* that information is critical and important:

> Dell has been the subject of criticism from environmentalists who say the Round Rock-based company doesn't do enough to protect the environment. They contend the most dangerous ingredient in old computers is lead from cathode ray tubes and solder used on the motherboard.[5]
>
> But the environmental groups contend Apple still needs to do more.[6]
>
> Some environmentalists complain that recycling is not keeping pace with electronics sales.[7]

Articles also reduced legitimacy by saying that the activist network's programs were something that they *call* as opposed to how a press release sourced article might describe a corporate recycling program–more factual instead of doubtful. For example, *USA Today* reported on the e-Stewards program, noting that:

> Environmental non-profit group Basel Action Network maintains a list of what it calls e-Steward recyclers, which identifies electronics waste recyclers that won't export toxic TVs or other e-waste to developing countries.[8]

When *CNET* covered Panasonic's program, it reported that:

> Panasonic announced that it is creating a nationwide program designed to provide consumers "convenient and easy" recycling of Panasonic branded TVs and other consumer electronics from the company.[9]

Activist reports contained a variety of research about e-waste issues. But when results are reported, the expertise is minimized by calling the actor an environmentalist rather than an expert, analyst, researcher–terms used to introduce corporate research and

public relations spokespersons. For example, *The Washington Post* reported that "Environmentalists say such substances can be harmful when buried in landfills, potentially leaching toxins into groundwater supplies",[10] whereas when *CNET* covered the results of Pike Research's report "Electronics Recycling and E-Waste Issues," the market research organization "touted" and "blamed."[11]

According to much of the coverage, e-waste activists and environmental activists generally are angry, cranky, feisty and unreasonable. One digital media article even tagged the article as "ecowhining,"[12] which implies that e-waste issues are reflective of whining environmentalists and thus are less serious. This also reflects the growth of snark as a journalistic tone in the digital media. Activists could be "watchdogs,"[13] but the demands that they made after watching were often construed as unreasonable or absurd, as one *The New York Times* article noted that, "Unsurprisingly, water bottles are under attack."[14] Another way to emphasize angry activists was to describe how the actor said the quote or statement: "Mr. Becker of the Sierra Club is blunter: ''People view offsets as papal indulgences that let them make environmentally bad decisions.'"[15] Though criticism of consumerism was not seen often, skepticism and criticism of consumerism was seen as being cranky. The gadget press's self-reflection/auto narrative style reflected this when the author of an article that had a small critique of consumerism says that they are "the resident *Gizmodo* 'no I won't upgrade my PowerBook' curmudgeon."[16]

While activists were angry, coverage also made fun of activists and activism, which can contribute to reducing legitimacy of activist and advocacy actors and concerns. Sometimes this was done through relying on tired stereotypes of environmental activists as hippies: "And if you've got a bit of the tree-hugging hippy spirit in you, you'll feel

good about cutting down on your e-waste output, even if only by a little bit."[17] Other times, articles minimized activist proposals as simple solutions to complicated problems and including quotes by industry actors who reinforced this message. *USA Today* exemplified this pattern: "Environmentalists are fairly glib (when they say mandated recycling by manufacturers) is going to solve all the design problems in the world, says Panasonic's Thompson."[18] *The New York Times* discussed corporate sustainability programs as being driven by environmentally motivated "determined employees, waving their recyclable pompoms and cheering on the laggards."[19]

Activists were also portrayed as unrealistic in their demands and critiques. There is a separation between activism and real life; regular life must go on. Part of this was pointing out that activists lacked concrete alternatives, such as *The Washington Post*'s observation that "There was no end of environmental sites admonishing me not to dump it, but few that offered concrete alternatives near me."[20] The real life that activists did not understand was about life as consumption. The undertone of this pattern is that advocacy actors don't get it that "only the most dedicated of environmentally aware consumers will do that. … After all, what are you going to do when next year's model comes along?"[21] This was also an early article and pointed to the problems with the consumer burden approach that industry sought early in the coverage cycle–that consumers would pay a fee to take back the products and were responsible for finding ways to get the products to the companies.

The other side of the spectrum was that activists acted morally superior or were overly judgmental, and that activists focused on principles not compromise. For example, *USA Today* quoting industry actors saying, "Others agree. 'Let's face it:

Environmentalists have a bit of a reputation for being sanctimonious,' Bendrick says."[22] Activism was connected to religious activity not just in moral superiority/moral values but also in how the activity was described, for example with *The New York Times* noting that "Proselytizing on the issue in housing projects is an enormous challenge but crucial, environmentalists say."[23] Since this is not a direct quote from the activist, the reporter's choice in using the word *proselytizing* to describe the activism elevates the moral superiority of the actions.

Not all coverage negatively depicted activism. Coverage also included organizational or individual activist profiles which also reinforced the researcher role of the activist organizations. Elizabeth Grossman's feature article for *The Washington Post* focused on the Digital Dump report published by BAN, but emphasized the researcher role that BAN's organization played and less the activist role, "a Seattle-based nonprofit discovered recently after sending a team to survey the situation."[24] The article portrays BAN more like a non-profit research organization and less like an activist organization. In late 2008, a *USA Today* article featured BAN's work, praising the organization as a "respected watchdog." The article also describes their operations with descriptions like "working on a shoestring budget from an office in Seattle with mismatched furniture and concrete floors" and discusses BAN's role in training and consulting with government investigators about "how to track illegal exports."[25] The article on the whole is favorable toward BAN and their e-waste activism; outlining the organization's successes compared to its scrappy, resource starved description could possibly motivate donors and help with fundraising for the organization. On the other hand, showing how precarious the organization is could also be a negative because it could minimize their threat potential to

industry observers.

5.1.2. Researchers and Experts

E-waste activist investigations and reports in many respects drove coverage or at least initiated media attention. Activists generated media coverage through the release of multi-media investigative reports. These reports were picked up by news outlets who either began their own investigations (like *60 Minutes* going to Guiyu, China, with e-waste activists or a *Frontline* broadcast focused on e-waste dumping in Ghana) or the outlets covered the information in the activist reports as the news. Sometimes articles were about other media outlets' coverage of e-waste issues, such as *Gizmodo's* article, "60 Minutes Reporter Investigates China's E-Waste Pits, Gets Attacked"[26], *CNET's* article "60 Minutes' Examines The Business Of E-Waste Recycling"[27], or *Wired*'s article referring to a *Washington Post* article about e-waste and China that was "recently reported."[28] *Gizmodo* sometimes would report on other digital media coverage, such as reporting on a *Wired* article–*Gizmodo* does not quote from the article but uses the original *Wired* article to cover the same issue in their article, noting that: "Our favorite electronics aren't always the easiest items to recycle, but Wired took a tour of a factory where they're stripped down to their essential parts so manufacturers can reuse the good bits."[29]

In the early phase of the cycle, legitimacy was encouraged in coverage of activist reports, and activist actors were treated as investigators and researchers. *The New York Times* article "that started it all" according to activists (Puckett, Hopson, & Huang, 2016, p. 85), quoted extensively from the e-waste activists report *Exporting Harm*, with phrases like "according to the investigators, who visited the region in December last year," or

"the researchers said." The article noted in the first sentence that the report was authored by "five environmental organizations."[30] This pattern continued; for example, as *CNET* covers an activist report, they describe the authors as *researchers*:

> In a report published by Clean Production Action and the Computer TakeBack Campaign, two groups studying environmental and health issues related to computers, researchers contend that potentially dangerous elements of brominated fire retardants are turning up in dust samples swiped from computers.[31]

Note that even though the activist actors are termed researchers, the verb used to describe their research is *contending* as opposed to verbs like *finding* or *demonstrating*.

While activists as experts began the coverage cycle, increasingly outlets relied upon confirmation through other media sources as experts, which the media outlets used to support or contrast the activists' research and claims. For example, the report *Exporting the Harm* was released by activists in early 2002. In early 2004, *IDG* finally covered the report, noting that the claims had been confirmed by others, not just the activists.

> In 2002, when two activist groups released a graphic and controversial report on the export of U.S. e-waste to developing countries. The report, released by the Basel Action Network (BAN) and Silicon Valley Toxics Coalition (SVTC), asserted that 50% to 80% of e-waste collected in the U.S. is exported to developing countries. … Follow-up stories confirming the e-waste situation in Guiyu appeared in major U.S. newspapers, including *The Washington Post* and the *San Jose Mercury News*.[32]

This also reflects the pattern of news stories covering e-waste coverage that focused on other media coverage about e-waste.

Overtime the coverage included an increasing amount of public relations and market analysis reports which followed the activist reports. Coverage also used experts and market analysts, instead of activist reports or numbers, to provide quantification of e-

waste problems.[33] For example, an *IDG* article in 2010 promoted the Keep America Beautiful (KAB) campaign. As discussed in chapter two, KAB has a lengthy history of promoting individual behavioral changes over industrial regulations and structural changes. The article, "America Recycles Day: Will you recycle your old PC, cell phone?"[34] reflects this, quoting no e-waste activists about the issues and including only statements from either press releases or websites of KAB or the International Association of Electronics Recyclers (IAER), a lobbying organization for scrap recyclers that have policy and fiscal interests in e-waste issues and scrap commodities.

5.1.3. Greenpeace, Prominence and Moral Drama

While the e-waste activist network was comprised of a variety of actors (see complete list in codebook, Appendix B), media attention, especially digital media, favored Greenpeace as an actor–at least in the headlines and leads of articles. Greenpeace's *Guide to Greener Electronics* reports were effective at generating coverage: Of the 57 articles that included the report topic, 20 included Greenpeace in the article title. In total, 24 of the 402 articles in the sample examined in the previous chapter included *Greenpeace* in the title of the article; of these articles, the digital media ran 21 of the 24 articles. Only three article titles included the words *environmentalists*, *environmental group*, or *activists*, while almost 20% of the headlines included the company name of OEMs who had been targeted by e-waste activist campaigns, like HP (18 headlines), Dell (21 headlines), and Apple (37 headlines). Despite not getting prominence in coverage in terms of headlines, other reports and e-waste activist actors did succeed in getting media attention. As chapter four discussed, articles that included

the e-waste activists' reports were more likely to have more comprehensive coverage of environmental justice and workers issues. But clearly the digital media was drawn to the Greenpeace name when generating titles for articles more than legacy media.

In addition to the Greener Electronics reports, Greenpeace's digital campaign, Green My Apple, launched in 2006. As noted by one of the organizers of the campaign, it "encouraged Mac lovers to push Apple to review its recycling policies and use of toxic chemicals" (DeLuca, 2009, p. 266). The interactive campaign won a Webby Award for best activist website of 2006 (Greenpeace International, 2007; The Webby Awards, 2007). The digital media, especially *Ars Technica*, was fairly hostile in their coverage, especially during the early Greener Electronics report releases and during the Green My Apple campaign. For example, *Ars Technica* began an article about the Green My Apple campaign: "If there are two topics around these parts that really riles up the natives, those two things are negative Apple comments and negative environmentalist comments."[35] The article proceeds to critique the campaign, particularly because it made the author (and implied readers) feel guilty. *Ars Technica* also lacked some of the historical context of Greenpeace's work on e-waste (and the larger activist network), asking, "So why is GreenPeace [sic] picking on Apple so much? ... There aren't any websites mocking Dell or HP."[36] Despite the article's complaint of unfair treatment of Apple, Greenpeace and the e-waste activist network had run lengthy campaigns about Dell and HP since 2001. The article also raises the critique of Greenpeace's work more generally–that they conduct campaigns primarily focused on getting on media attention.

> It seems that GreenPeace [sic] is focusing a lot more on Apple, perhaps the hottest company in personal computers and undoubtedly in portable music players, for the press. I realize that I'm helping them obtain this, and perhaps that isn't a horrible thing, but it needs to be pointed out so our

> readers can make their own decisions. So to recap, I like Apple, I like the environment, what's a person to do?[37]

As the Green My Apple campaign escalates in 2006, *Ars Technica* eventually runs another article a few months later that advocates somewhat tepidly that Apple should be responding to the Greenpeace campaign, noting that

> Steve Jobs might do well to cut a deal with these people and let some other company become the "Think Brown" poster-child, rather than risk a continued confrontation. Some might call that extortion, but one could also call it a "Green Apple Tax."[38]

Despite the change of opinion, the outlet still refers to the activists as *these people* and connects the campaign to *extortion* (somewhat jokingly) rather than the environmental justice issues that the campaign focused on.

The Green My Apple campaign was part of many attempts by e-waste activists to shame and praise corporations into improving their products and take back programs–this dynamic was reflected in coverage. These tactics reflected "the moral drama" messaging strategy which sought to raise awareness and change e-waste policies through telling a story about "clashes of values embodied in clearly identifiable victims, villains, and heroes" (Raphael & Smith, 2006, p. 254). As e-waste activists have discussed, these "tactics to distinguish industry leaders and laggards on labor and health issues" aimed at "countering arguments that improvements are impossible and pressuring bad actors to raise their standards to meet those of higher performing companies" (C. Raphael & Smith, 2016, p. 333). While *Ars Technica* did not respond well to this messaging–the early coverage was almost defensive of Apple, as if they, *Ars Technica*, were also being attacked as a villain–their coverage of the campaign did mellow with time. Another

digital outlet, *Gizmodo*, also responded less than positively to the moral drama framing tactic. *Gizmodo* noted that "a group called the Electronics TakeBack Coalition is trying to shame major companies into some e-waste recycling initiative by giving them report card scores."[39] The tone seems not that concerned; the verb "trying to" implies they are not being very successful at the "shaming." However, the section of the text that reads, "some e-waste recycling initiative" is linked to an earlier *Gizmodo* article[40] that reviews a 2008 GAO report about toxic flows of electronics (Government Accountability Office, 2008). If readers follow the link *and* read the report, the *some* is qualified, but whether readers follow the links and the contextual information is unclear (and difficult to determine due to proprietary web traffic information held by the media outlets).

Digital media coverage of Greenpeace is also notable for the very different tone compared to legacy media coverage of highlighting some of the moral drama and the praise/shame strategies. For example, in April 2007, the *Associated Press* ran the following headline: "Greenpeace ranks Apple Inc. last among 'green' electronics makers, China's Lenovo first."[41] Both *Wired* and *Gizmodo* covered the same report; *Wired*'s article "Apple is Rotten in Greenpeace Computer Ranking"[42] doesn't highlight Lenovo's praise from Greenpeace and focuses on the poor ranking of Apple. One month later, *Gizmodo* took this even further while also editorializing about Greenpeace in the same headline, "Apple Still Not Green Enough, According To Greenpeace Wackjobs."[43] Later in the year, a similar dynamic occurred between *Gizmodo* and the *Associated Press*'s response to another Greenpeace report, both articles published on the same day (November 27, 2007). The *Associated Press* titled their article "Greenpeace Ranks Microsoft, Nintendo, Philips Worst in Phasing Out Toxics, Taking Back Waste"[44], while

Gizmodo's was "Sony Ericsson and Samsung top Greenpeace green list; Nintendo worse than Exxon on crack?"[45] Both articles are covering the report, but the language used by *Gizmodo*, such as referencing *crack*, is more dramatic than the *Associated Press*. Unlike the earlier coverage, the *Associated Press* drops the heroes component of the heroes/laggards story, while *Gizmodo* highlights the moral drama framing that e-waste activists sought to included in coverage.

5.1.4. Erasing Activism

Coverage tended to give little historical context of environmental justice activism. This contributed to the erasure of the role of activist campaigns and public pressure on changing corporate practices regarding e-waste. Erasures of activism happened through generalizing, providing vague or no historical context to present policy or news event, and reducing legitimacy through descriptions of activism. An early *CNET* article [21203] that reviews Dell's recycling program is a good example of an article lacking context and focused on industry perspective of the issues, even though it included activist sources. It heavily relies on industry sources even though the story is about Dell backing down and agreeing to change in part due to activist demands.[46] Rather than address those demands and the activism surrounding the "Toxic Dude" campaign (Wood & Schneider, 2006), the article, generalizes the campaigning, making it not about Dell, but rather the "industry as a whole."[47] The article notes that: "The move is likely to provide some satisfaction to environmentalists and others who have been calling for the electronics industry as a whole to take greater responsibility for what's become known as 'e-waste.'" [48]

Environmental justice activism around e-waste was also regarded as "scrutiny"

rather than activism. For example, *CNET* noted that

> Of course, unburdening yourself of your old electronic gear isn't the only thing to consider. Thanks to more scrutiny of the electronics recycling industry, many people are concerned about exporting e-waste to poor countries, where there can be serious health impacts.[49]

While the article does identify some of the environmental injustice surrounding e-waste, it does not discuss what these health impacts are or how they occur–like ground water pollution and poisonous air through burning electronics in disassembly; nor does it connect the scrutiny to the range of campaigns and investigations of the e-waste activist network. Decontextualized activism also occurred through focusing attention on how companies were responding to problems based on their own accord, rather including other actors involved challenging and promoting changes. For example, a short article said that "In recent years, tech corporations, including Dell, NEC, HP, and others, have accelerated efforts to safely dispose of their used goods."[50] Articles could also refer to "critics" who "say the work poses risks to the villagers and the environment"[51] however, it is unclear who the critics are, though they are most likely activists.

Another way to exclude activist actors was to refer to them as "some" rather than as part of the stakeholders involved in the issues, for example, *The New York Times* in 2009 noted that:

> While the industry makes its first tentative moves toward a more environmentally aware future, some say the impact of such programs will be minimal until the manufacturers increase the green characteristics of their most popular products.[52]

Coverage also minimized activism through describing the outcomes of the activism and not the actors, such as, "International pressure is pushing companies to do the right thing with their e-trash." However, this short article is notable for briefly including a

description of the Basel Convention and noting that "The U.S. hasn't ratified the ban"– contextual information which was not include often in coverage. [53] Additionally, articles would refer to concerns but not who is making the concerns or the history of the campaigns. For example, in 2003, *The Washington Post* reported that Dell had a new recycling service, describing the service as "intended to help address environmental concerns over the toxins that can emanate from improperly discarded computers and other electronics."[54] Dell has just come from a multi-year public campaign against them– the "Toxic Dude" campaign. The article does include one of the e-waste activist frames by briefly discussing the topic of e-waste as toxic waste, but the article minimizes the organizing and activism (and public relations problems Dell had been having due to the campaign). The article quotes a Dell executive and a non-profit involved in digital divide issues (National Cristina Foundation), but not an actor from the e-waste activist network who raised the *environmental* concerns.

In late 2005, the *Associated Press* provided an article that broke this pattern. The long article heavily quoted activists (nine out of eleven total quotes were from e-waste activist actors), scored high on the EJ Themes index, gave contextual information about the e-waste activist network campaigns and attributed changes in e-waste problems to activism, such as saying "After a campaign that resulted in significant improvements to the recycling program of Dell Inc., many e-waste activists are focusing on Apple."[55] *CNET's* later coverage offered a good review of the history between Greenpeace, Apple, and Steve Jobs. The article "How Apple and Greenpeace Made Peace," published in late 2011 after Steve Jobs died, is generally focused on praising Jobs for his contributions on improving environmental impacts of Apple products, but does offer some historical

context of activism and public pressure–that Jobs and Apple were pressured to change the environmental policies. For example, the article notes that:

> Apple and environmental watchdog group Greenpeace waged a public battle over how "green" Apple's products were over several years while Jobs was CEO. Environmental groups continue to pressure Apple to improve on some issues, but Apple's products today do not have the toxic chemicals that were there before regulations and environmental groups prodded the electronics industry to change [56]

While the CNET obituary of sorts for Steve Jobs was a notable case where coverage contextualized activism, generally, if coverage included attention to regulations and increasing consumer demands for improved corporate practices and less toxic products, these issues were separated from the broader e-waste activist network that was encouraging the pressure and policy changes. Coverage would give companies credit for shifts in the behaviors with minimal or no discussion of activism and/or policies and regulations. An example of this is *CNET*'s exploration of the greening of CE/ICT at the 2010 CES. Primarily comprised of industry quotes about OEM's predictions for their green market share futures, the article does note that

> much of the environmental activity in electronics is driven by regulations. Global companies have to comply with hazardous material rules, such as the RoHs directive in Europe or state-driven electronics recycling laws in the U.S.[57]

The article also identifies that "Consumer demand, too, plays a role in nudging manufacturers to build environmentally oriented gear."[58] How do consumers learn about the problems that they demand be changed? How have the policies and regulations occurred? Through reading this article it seems these occurrences are almost a side note to the initiatives and desires of industry to become greener, because, as a Toshiba

spokesperson is quoted saying, "We need a sustainable world where people can keep buying products and living well, and we can keep making products."[59] At the very end of the long article, the last paragraph does reference the most recent Greenpeace *Greener Electronics* guide, but generally, the article is good example of excluding or marginalizing the broader environmental justice activism that e-waste activism draws from and reinforces that individual consumers and corporations make the changes.

5.1.5. Policy Processes

E-waste policy struggles occurred in transnational, federal, state, and local arenas. The absence of a national U.S. policy meant that e-waste activists were working on multiple fronts to pass state bills around electronics disposal. There were also policies developing in the European Union, like the RoHs and REACH laws. Coverage reflected the chaotic and confusing nature of e-waste regulations–the policies were described as a "patchwork"[60] [61] or a "free-for-all."[62] The way that the policy processes were discussed connects to the various actors involved in e-waste issues but also to reframing that was happening throughout the issue cycle. For example, as discussed, activists were portrayed as angry. Angry activists were involved in "contentious"[63] debates; they were "bickering"[64] and "forc[ing]" regulations or the "threat of legislation."[65] In 2005, *CNET* warned readers to "prepare for a growing battle over how businesses big and small should get rid of their appliances."[66] The reliance on industry actors reinforced the message that activists were unwilling to compromise and that industry was making all the compromises. For example, *USA Today* focused on activists' unwillingness to compromise, using industry actor quotes to reinforce this message:

> The company wants to use green products, but there are often not good alternatives available, says Doug Smith, director of corporate affairs at Sony. "Environmentalists operate on principle, not on compromise," he says.[67]

The sourcing patterns which elevated industry policy positions or minimized other perspectives as the above examples show, was part of a pattern in coverage that advocated for industry to resist regulations by acting before regulation can happen. For for example, *CNET* wrote, "If the companies want to show state and federal legislators that laws compelling PC recycling are unnecessary, they'll have to act fast."[68] This message embeds the assumption that industry lead voluntary changes will be what happens, which reinforces the lack of momentum for a national regulatory policy. It's also reflective of neoliberal discourse which prioritizes the private sector rather than public policy and discourages regulations unless they re-regulate systems in favor of industries.

A 2008 *CNET* article reflected industry perspectives of "inefficient" regulations. The article notes that efficiency is key issue for policy discussion. In the lead and second paragraphs, the article claims that politicians say efficiency is important and then in seventh paragraph notes that, "For years, numerous major electronics manufacturers" have argued that the patchwork of state laws "will only breed inefficiency, confusion, and higher prices for consumers." The article later includes direct quotes from HP:

> 'We see that as a burden on current consumers that is really going to pay for the waste of former consumers,' said St. Denis, who added that her company has found California's system to be 'inefficient.'[69]

By 2011, *CNET* refers to "industry-led initiatives"[70] or the voluntary programs that activism had pressured companies to take on, due to the absence of a successful national policy.

Another way that the political work surrounding e-waste was minimized was to refer to laws as programs, like *The Washington Post* did, "A dozen states, including Maryland and Virginia, have set up recycling programs for electronics, often requiring manufacturers to contribute to the recycling effort."[71] Generally, coverage rarely revealed policy processes such as lobbying. An early *CNET* article hinted at the mechanisms behind policy making but did not really say who is involved or what will be discussed. There was no indication that this could be a regulation on industry as opposed to an industry imposed fee on consumers. "The various end-of-life fees may eventually be supplanted by recycling costs that could be tucked in to the purchase price of all PCs, depending on the outcome of industry wide talks set to conclude in September."[72] The article refers to the National Electronic Products Stewardship Initiative (NEPSI) which reflected one of the attempts by activists, government and industry to have a "multistakeholder dialogue" to develop national legislation (Raphael & Smith, 2006, p. 251).

Occasionally articles did mention the influence of OEMs' lobbying power, like the *Wall Street Journal* reporting on the Cellular Telecommunications and Internet Association (CITA) and the industry's opposition to e-waste regulations: "The Cellular Telecommunications and Internet Association, the main wireless trade and lobbying group, opposed the bill but says it expects it to be signed by the governor." [73]
Or the *Associated Press* covering the lobbying and spending of OEMs in 2007, noting in one article that in the first half of 2007, Dell

> spent $800,000 to lobby the federal government in the first half of 2007, according to a disclosure form….[Dell] lobbied Congress on technology and trade issues, including data security, export controls, health care information technology and computer recycling…[74]

Later in 2007, the *Associated Press* also reported on the CEA's lobbying in 2007–$1.5 million[75]–as well as Samsung's lobbying around the digital television transition.[76] This wide sweeping FCC policy began in 2005 and took effect in 2009.

5.1.6. Digital Television Transition

The story of the digital television transition became a consumerism story absent from policy, even though the digital transition was the result of policy. Title III of the Deficit Reduction Act of 2005 authorized the Digital Transition and Public Safety Act of 2005, which mandated a switch from analog to digital television signal transmission (Digital Television Transition and Public Safety Act of 2005, 2006). The conversion originally was to occur on February 17, 2009, but was pushed back to June 12, 2009, because many households, especially "low- income households, large numbers of senior, minority and disabled viewers" had not converted their televisions with federally provided (discounted for some populations) converter boxes (Elliot, 2009). The e-waste activist network used the digital television transition to pressure television manufacturers to improve their take-back programs, releasing a range of investigative reports and manufacturer report cards throughout 2008 and 2009. E-waste coverage reflected some of these reports but also focused on reporting about OEMs's recycling programs and environmental initiatives. E-waste coverage that included the digital television transition story focused on consumers and greening CE/ICT. This was primarily a consumer narrative about how consumers would transition to being HDTV consumers and a green publicity opportunity to emphasize that OEMs were improving their behaviors and expanding their take-back programs.

Coverage of the digital transition within e-waste coverage did not receive much attention until February 2008, when the *Associated Press* reported about Samsung's lobbying costs for digital television.[77] During Earth Day month *The Washington Post* connected electronics recycling to the digital transition, "Switching to the Recycling Channel; Area Girds for Digital TV Changeover"[78] and included e-waste activist actor Barbara Kyle commenting on the consumerism expected to accompany the digital transition. Kyle's quote did include a connection to the responsibility of manufacturers to recycle the older television sets –

> "I think a lot of people are going to use the digital switch as a reason to buy a new TV," said Barbara Kyle, national coordinator for the Electronics TakeBack Coalition, which runs a campaign urging electronics manufacturers to collect old TV sets from consumers and recycle them for free. "The question is what happens to all the TVs people are getting rid of."[79]

During 2008, the reputation dance between e-waste activists and OEMs intensified. While coverage may not have been exclusively focused on the digital television transition, e-waste activist campaigning continued to push for improved corporate practices and policies. Throughout the year, e-waste activists published a range of e-waste reports. Also throughout 2008, many stories covered recycling programs sponsored by OEMs and retailers. These articles about OEMs's recycling programs tended towards the public relations story form, where the only sources of information are from the corporation or actors that the story is about (and seems to redirect attention to a company's intended message). For example, on May 20, 2008, Greenpeace released a report about toxics in video gaming consoles, "Playing Dirty" (Brigden, Santillo, & Johnston, 2008). *Wired* covered the report on May 27; however, following this article

there was an entire week of coverage focused on Best Buy's announcement of a "free e-waste recycling program."[80] Most stories ran on the same day–June 2, 2008.

06/02/08	Best buy to recycle electronics for free[81]
06/02/08	Best Buy testing free e-waste recycling program[82]
06/02/08	US watch: Minnesota: Best Buy to test program to accept electronic waste[83]
06/02/08	Best Buy testing free e-waste recycling program (no catches, so far)[84]
06/04/08	Best Buy test drives new electronics recycling initiative[85]

Following this extensive coverage of Best Buy's program, few articles covered the Greenpeace report on video game consoles. In late June, Greenpeace published the 8th edition of their Greener Electronics Guide (Greenpeace International, 2008a). By this point, Greenpeace was releasing new versions of the guide every three months (Greenpeace International, 2008c). During the week that Greenpeace announced the 8th edition, *CNET* ran two articles: "Tech makers fail to clean up their act, says Greenpeace"[86] and "Sony phones beat rivals on green scale"[87] A month later, the *Associated Press* included coverage titled "Greenpeace cites rising e-waste in Africa."[88]

August 2008 was a big month for industry promotion of recycling programs, possibly because Greenpeace's next Greener Electronics Guide was due in September. *IDG* ran a very long feature article in early August which quotes at length from corporate emails, websites and interviews about the environmental programs they offer. The article focused on design improvements like reduced toxics and improvements to recyclability. The article reviews the Greenpeace guide results from June and offers manufacturers space to reply to the rankings and promote their improvements and new programs. A Greenpeace activist is interviewed; the activist uses the article to reward the good behavior of companies but also includes some of the larger contextual information about

activism and policy struggles as well. The article notes that

> a toxics activist at Greenpeace says many manufacturers have made their product lines more environmentally friendly in just the past few years…. He credits such successes to technology advances, the development of alternative materials, legislative requirements and customer demands.[89]

The same Greenpeace activist is also quoted much later in the article reviewing the abysmal rankings of video game console makers. The author also includes a brief discussion of the earlier report, "Playing Dirty," which did not receive much coverage. While the inclusion of multiple Greenpeace reports and more space for the activist's answers could have expanded the article's coverage of environmental justice issues, the article overwhelmingly presents industry's perspective and corporate social responsibility talking points. Of the four industry actors quoted at least once in the article, three are described as having a job title related to environmental programs in the company–for example, "Sun's director of eco-innovation solutions" or "vice president for social and environmental responsibility."[90]

Giving space to corporate voices promoting their own programs continued. A few days later, *Gigaom* ran a story about LG–which had scored third-lowest in the Greenpeace guide–titled "LG and Waste Management to e-Cycle LG Gear for Free." This article is another example of the public relations story form, seemingly used to counter negative publicity from the activist reports and promote a recycling program. The only sources of information are statements from LG and Waste Management; the main point of the *Gigaom* article is that these companies made an announcement. The article includes a direct link to the press release and also notes, without sources or seemingly any other research, that "While the release makes no mention of the terms of the deal, we're

thinking LG is likely subsidizing the costs of the program." Focusing attention on a guess that LG subsidizes the programs contributes to the erasure of the larger structural issues and the responsibilities of OEMs for environmental problems. The article does include a minor commentary that "electronics recycling is gaining steam with manufacturers seeking brand-halo through green programs," which alludes to the PR motivations of greening programs like the take back and recycling initiatives. [91]

Samsung followed with a similar press account in *CNET* about Samsung's recycling program announcement one month later. Samsung had scored forth in the 8th edition of the Greenpeace report, with the major deduction due to "incomplete takeback practices" (Greenpeace International, 2008c). Like the *Gigaom* article about LG and Waste Management, *CNET* also only quoted Samsung, who "says it is partnering with recycling programs 'that do not incinerate, landfill, or export toxic waste to developing countries.'"[92] This story appears one week before another release of the ninth edition of Greenpeace's Greener Electronics Guide (Greenpeace International, 2008b).

Despite these articles covering e-waste issues, coverage was quiet about the problem of the digital television transition until October, when *Wired* reported that "DTV Transition Will 'Puke' on Environment, Says Recycling Group."[93] This story covers the announcement of the e-waste activist network's campaign launch of the Electronic TakeBack Coalition's TV Zombies campaign (Electronics TakeBack Coalition, 2008b). *Wired's* article misses the plot of the zombie television story that the activist campaign focused on–that TVs come back from the dead as e-waste, poisoning people and the earth. The campaign's video identifies the digital transition as "the largest government mandated planned obsolescence campaign in history" (Electronics TakeBack Coalition,

2008b, pt. :10 sec), and while the video is linked to in the article, this message was not picked up by *Wired*. The article focuses on the campaign's goal to "encourage consumers to participate in manufacturers' recycling programs rather than throw away their TVs." The *Wired* article does begin with the environmental and health risks of old televisions, noting in the second sentence that -

> The Electronics TakeBack Coalition believes tens of millions of Americans will throw away their old televisions when TV broadcasters eliminate analog programming and go fully digital. What's more, the coalition says, many of those TVs will end up in landfills, posing health risks if their toxics contaminate groundwater and surface streams. [94]

The article also gives some contextual information about the DTV Transition and minimally notes the option of convertor boxes for existing analog televisions – but provides no information (or links) about this program. The 2008 GAO report (Government Accountability Office, 2008) is directly linked to and highlighted at the end of the article, right before the article concludes with a focus on Apple's "Greener Apple" statement, the very publicized open letter that Steve Jobs wrote in response to the Greenpeace campaign (Jobs, 2007).

During the same period, the ETBC achieved a creative feat by culture jamming Panasonic with an ad run on a Times Square CBS JumboTron made by Panasonic (Electronics TakeBack Coalition, 2008a) or as *Gizmodo* reported, "a clever bit of green marketing" and an "ad warning of 'toxic waste' on Panasonic's own proud Times Square display."[95] The story of the culture jamming ad was not picked up by any of the other media outlets studied. *Gizmodo* ran the story via the *Treehugger* blog, which reflected *Gizmodo*'s (and their parent organization, Gawker Media) early and news industry changing practice of running aggregated content that *Gizmodo* writers then commented

on as *Gizmodo* articles (M. Ingram, 2011; Seward, 2009).

The ETBC brought their TV zombie campaign to the 2009 CES show–though again only *Gizmodo* covered their action, noting that "Dancing Zombies Promote TV Recycling at CES via Extreme Awkwardness."[96] This is a great example of the digital media tone and style: While the title and general review of the campaign is slightly negative and humorous or snarky, the article does positively discuss the campaign's goals, saying that

> their message, that TV companies should provide convenient ways for people to recycle their old sets to protect the environment, is solid. And their methods, while awkward, are helping them get the message out, this post included. So kudos, awkward zombies.[97]

Unfortunately, no other outlet in this study covered this action at the CES conference.

While articles occasionally covered the DTV transition in their coverage of other e-waste topics, it was not until June 2009 (the month the transition happened) that a couple of articles appeared that focused on the digital transition's contribution to e-waste growth.[9899] Later in the year *The Washington Post* covered TV recycling and the impacts of the digital TV transition in a long front page article, noting that:

> America's unquenchable craving, even in a recession, for the latest and greatest in electronics, and the nation's switch to digital television broadcasting in June, have combined to send consumers racing for flat-screen TVs -- and has made them anxious to rid their homes of their tube-based relics.[100]

The article includes no activist or advocate perspectives but does make time to include a quote from a "marketing guru," who says

> "Ever since the human being appeared, we've been hard-wired to hunt for better and bigger," said Martin Lindstrom, a marketing guru and author of "Buyology." "And that makes us think, 'I don't want to end up being the last person on planet Earth left with a CRT.'[101]

The article also reflects the pattern of highlighting the difficulties people face when trying to recycle: Individuals try to do the right thing, but they lack real attention to the structural issues and minimally addresses responsibility for e-waste. But the nugget of this article is here:

> Alas, these televisions don't have much going for them. In technological terms, they use cathode-ray tubes -- CRTs. In layman's language, they are clunkers. Like Formica countertops displaced by granite, they no longer seem sleek. Like gas-guzzling autos surpassed by hybrids, they can no longer claim the cutting edge. They are fully functional dinosaurs in a high-def age. They just aren't, like Carroll's new TV, flat.[102]

The televisions work but they have lost their appeal to consumers, which benefits the manufacturers. The article missed an opportunity to offer more criticism and environmental justice perspectives about the implications of the digital TV transition.

The story of the digital television transition became a consumerism story absent from policy, even though the digital transition was the result of policy. Opportunities to educate readers about options to keep their existing televisions through federally mandated free or discounted converter boxes were minimally discussed, and most stories did not mention converter boxes, like in *USA Today's* article "Take care recycling old TVs" which connected the reader education about television recycling to the digital TV transition, noting in the paragraph, "Have a junker TV sitting in a back bedroom or home office that won't be making the digital TV transition? Don't just put it out on the curb."[103] This short story included some information from BAN that encouraged people to recycle their televisions responsibly. Through this information, the e-waste activist network's perspective was highlighted, but there no mention of the ways you could possibly keep your existing television after the digital transition.

Though the digital transition became consumerism driven story, the initial

discussions and the reason that the policy was delayed was due to digital inequality issues. The transition made existing analog televisions unusable with out the converter box; for many U.S. residents, particularly from poor and marginalized communities, broadcast television (like radio content) was their only access to information (Ridgeway, 2009). The next section discusses how e-waste media coverage addressed digital inequalities, beyond the digital television transition.

5.1.7. Digital Inequalities

One of the curious things about this issue is that there was some good education efforts to get consumers to recycle their computers to programs that supposedly helped with alleviating the digital divide by bringing older electronics to communities and populations that needed them. In early coverage, the recipients of the used electronics were given attention as "needy people"[104] who lacked computers and then later phones as mobiles became the device that the reuse market increasingly focused on. Phones are also technically easier to repurpose, according to *The New York Times*.[105] Refurbishing is a need and a community service: programs that provided phones to victims of domestic violence occasionally were referenced. For example, the Call to Protect program is used as an example of how reuse and refurbishing is a useful strategy to reduce e-waste

> In the meantime, most efforts are focused on extending the useful lives of old handsets and recovering potentially harmful chemicals from those that no longer work. Several million used handsets are now being refurbished or recycled each year. Proceeds from resold handsets and recovered raw materials go to charities such as Call To Protect, which aids victims of domestic violence.[106]

A feature on the non-profit recycler, Free Geek, quoted their founder making a direct link between digital inequalities and recycling electronics. The article describes

that organization as one “whose volunteers build computers out of donated parts for use by low-income families as far away as South Africa.” The founder is quoted saying, “We were the first to see that you can solve both problems right there — digital divide and e-waste."[107] This description of South African families being low-income rather than simply poor, was actually unusual in the coverage, also, as will be discussed later, that a country was named and not simply the continent of Africa was also unusual.

There were assumptions of access, such as when a *Gizmodo* article from 2009 exaggerates how many people have iPods: “Considering about 118% of the United States' population has an old iPod lying around somewhere by now.” But there was little inquiry as to why people cannot own a new phone or new device. The same *Gizmodo* article also connected older technology to a country’s development status: “No, you're not seeing things. The image above is indeed a picture of my primary media player, and yes, it is an iPod mini. Go ahead, get the Borat jokes out of your system.” [108] The implications behind this are that if you use older technology, you are from a developing country, and an unflattering characterization of a developing country at that. Even though the Borat character used parody to illuminate Western/American racism/xenophobia, the connotation of the Borat name is not necessarily read with critical rhetorical analysis by all audiences (Chehade, 2007; Wallace, 2008).

A key concern of the Digital Dump report was the abuse of the reuse and refurbishing clauses of export laws. One of the main points of the *Digital Dump* report was to show that the good intentions were being abused, but also that policies were enabling this because of the classification vagueness of electronic waste. Some articles explicitly covered the delayed dumping through donation issues raised by the *Digital*

Dump report.[109] Others alluded to some of the issues behind the donations as gifts and waste–the commodities embedded in the devices are the driving force behind what gets wasted.

> Dell isn't the only computer company trying to get consumers to recycle. Hewlett-Packard Co. charges consumers $ 13 to $ 34, depending on the item, and also passes on the used equipment to nonprofits or breaks it down to key commodities, depending on its condition.[110]

The Digital Dump report spends a significant amount of space discussing the role of the re-use and refurbishing markets in Nigeria (the report was focused on Lagos). The authors note that there is the

> presence of a very large, highly educated and well-trained but low-wage informal sector with an impressive ability to repairing and refurbish the used electronic equipment for local resale" [however a significant amount of used electronics that are exported to Nigeria are] "considered junk. That is, it is unmarketable due to either its lack of computing effectiveness, or due to the fact that it is un-economic to repair. (Puckett et al., 2005, p. 6).

Throughout the report, workers in the electronics repair sector from Nigeria are quoted and featured, referred to as *technicians, repairers* and *workers*. The report also describes some of the informal dumping sites where the over abundance of non-working and non-repairable electronics are burnt and/or dumped. These sites are

> in swampy waysides and in lots wedged between shops and residential apartments … a series of fairly large dump and burn sites where goats gamboled, chickens scratch and children and scavengers roamed at their peril. (Puckett et al., 2005, p. 23).

The report clearly distinguishes the technicians in the street markets repair and reselling electronics and the *scavengers*, who "were children and teenagers, trying to eke out some valuable bits of copper scrap." (Puckett et al., 2005, p. 23). As the next section details, these descriptions of scavenging and the informal burn dumps were used throughout

coverage, but coverage amplified the stark differences between the technicians and scavengers while having limited discussion about the expertise, education and interviews with technicians or the people involved in material collection at the burn/dump sites.

5.2. Environmental Justice: Labor Rights

> Trade in secondhand electronics has recently become very visible in a very selective way through coverage in Western media outlets of the electronic waste (e-waste) problem in developing countries. Ghana, along with Nigeria and China, are the countries typically singled out for attention…US-based environmental organizations, including Basel Action Network (an NGO dedicated to the e-waste issue) and Greenpeace, have fueled and shaped some of this attention (Burrell, 2012, p. 162).
>
> Reports by the e-waste network have framed the illegal e-waste trade as an example of the exploitation of poorer countries and vulnerable populations by richer countries and populations (Edge, 2011, p. 160).

The section explores how e-waste labor was defined through media coverage. I discuss the differences between descriptions of formal and informal e-waste disposal sites and examine how the location, processes and people involved in e-waste labor were described. For a news story about how people are dismantling electronics in horrific conditions, the overall absence of labor and laborers in e-waste coverage was surprising. This section expands upon the findings in chapter four regarding the absence of e-waste workers' voices in media coverage and looks at what perspectives were absent in the media stories focused on a Western and often U.S.-centric approach to technology use and repair. After tracing the trajectory of the framing of formal and informal e-waste disassembly sites, first through prison labor, I then examine how issues of repair and reuse in the formal sector were covered in the news and look at the overall links between

how e-waste labor was discussed in connection with the growth of the e-waste sector.

5.2.1. Prisoners and Informal Labor

Issues of labor were discussed in terms of the sites of labor, the processes involved in labor, and descriptions of the people laboring. Media coverage reflected, from the beginning, a divide between describing e-waste labor in formal and informal spaces. Formal spaces were regularly described as being clean, highly technical[111] as opposed informal spaces which were too primitive, dirty, etc. For example, describing the labor done at the formal e-waste recycler, RetroBox, as an "environmentally sensitive recyclers"[112] and labor done at an informal disassembly site "old fashioned", "less than green", and "quick and dirty."[113]

The dynamic of technical vs. primitive was in some respects emphasized by the early e-waste activist reports and quotes. In June 2003, the e-waste activist network released a report about prison labor and e-waste titled, *Corporate Strategies For Electronics Recycling: A Tale Of Two Systems* (Silicon Valley Toxics Coalition, 2003). The report focused on how the Bureau of Prisons and private contractors involved in running federal prisons like UNICOR were using prisoners to recycle and dismantle old, broken, and used electronics for private companies, like Dell. Aside from the title, which references the Charles Dickens book (*A Tale of Two Cities*) and a clear divide between rich and poor, the report's executive summary stated:

> These recycling operations suggest two paths for the future of e-waste recycling in America. One path leads toward efficient, transparent, modern facilities staffed by free labor, possessed of their rights as contemporary employees, able to protect themselves and nearby communities from harm. The other path descends into a closed, Dickensian world of prisoners condemned to dangerous work for little pay under back- ward

> conditions. Depending on the path we choose, e-waste recycling can contribute to community economic development and environmental protection, or can become the equivalent of breaking rocks on a high-tech chain gang (p. 5).

While this report was focused on labor in the United States and the exploitative, toxic and unjust labor required of prisoners, the metaphor of the two systems continued throughout coverage of e-waste. The report compares Dell and UNICOR's brutal, by-hand labor of prisoners, to HP's clean, safe, and technical recycling program. *CNET* covered the issue one week after the report was released by focusing on a tour of HP's facilities. The article is a positive press opportunity for HP and reinforces the heroes and villains story line that e-waste activists employed. *CNET* follows the e-waste activist report's attention to the technology and machinery needed to improve workers' safety and quotes from the report to reinforce the distinction between the formal and informal sites,

> In a report issued last week, the SVTC praised HP's program while criticizing Dell's partnership with UNICOR, which employs inmates at Atwater prison to disassemble the machines, sometimes requiring them to smash the machines by hand. The report compared the program to a "Dickensian world of prisoners condemned to dangerous work for little pay under backward conditions."[114]

The *Associated Press* began their coverage of the Two Systems report with a lead sentence that laid out key activist frames and directly reflected the report:

> Dell's "primitive" recycling system exposes prison laborers to dangerous chemicals and thwarts the company's hallmark efficiency, an advocacy group says, while Hewlett-Packard's modern plants protect workers and the environment.[115]

Less than a week later, the *Associated Press* reported that "Dell drops recycling company that used prison labor," noting that Dell's spokesman "said the switch in vendors was not related to the California group's report."[116] The article does not discuss the multiple year campaign that the e-waste activist network had run against Dell since late 2001 (Wood &

Schneider, 2006, p. 295). *The New York Times* announced a day later that "Dell stops hiring prisoners for its recycling program."[117] While a minor word difference in these headlines, there is a difference: Dell was not *hiring* prisoners: it was *outsourcing* the labor and electronics dismantling to a private company that manages prisons. The prisoners were not employed by Dell. However, *The New York Times* contextualizes the policy change by beginning the article with a clear acknowledgement of the work of activists (advocates): "Responding to concerns from both customers and environmental advocates," though later in the article a Dell spokesperson is directly quoted saying "We did not make a decision based on special interest groups,"[118] which refocuses the change in policy as Dell's initiative and away from the role of activist pressure.

While the prison labor used for e-waste recycling was in many respects an informal site within a formal organization (the conditions that the prisoners had to work in were, in some places, very similar to the conditions of the open air disassembly sites that other activist investigations and media stories covered), the framing was applied to the differences between the formal and informal sector and more often between electronics disassembly in the north and developed countries and south, developing/less developed countries. The Two Systems report was published in 2003. Throughout the next decade, *CNET* and other outlets continued the "Dickensisan" descriptions of informal disassembly sites as such as in 2012, noting that "To a Western eye, it was almost Dickensian"[119]–almost a direct lift from the prison labor report from 2003, but now the differences in location, nation, development status, and the history of colonialism, are embedded into the frame.

5.2.2. Describing People and Processes

Coverage increasingly distinguished sites of recycling and disposal, using the informal and formal categories to highlight the differences in the processes, infrastructure and technologies used for dismantling, recycling and reusing electronics. The articles often discussed highly technical recycling with descriptions that showed how clean and organized the processes are compared to the descriptions of informal sector. For example, *The New York Times* notes that "Over the years, the industry, once largely made up of small and dangerous backyard operations, has developed its own high-tech expertise."[120] The informal sector could be "scrap shops in the developing world"[121] or neighborhoods where "the 'guerrilla' junkers" collect electronics on their bicycles."[122] Workers in these sites used "crude methods"[123] and "makeshift smelters"[124] to recycle or dismantle electronics.

Descriptions of disassemblers reflected the dynamic of the technical vs. primitive frame–the people who recycle and process the used electronics could be technicians, skilled at reuse, jury-rigging, creative solutions, on the one hand, or scavengers, grabbing and seeking the last drops of the commodities to sell (harvest) on the other. If the larger infrastructure of the e-waste sector was included in descriptions, sometimes the people were "electronics dealers" participating in the market.[125] While in the formal sector, workers were described as "technicians"[126] and "workers clad in safety gear."[127]

People working in the informal sector were described as poor, filthy, and ignorant. For example the *Associated Press* wrote,

> Migrant workers in filthy clothes smash picture tubes by hand to recover glass and electronic parts, releasing as much as 6.5 pounds of lead dust. … Many of those who do the dirty work are migrants from poorer parts of China, too desperate or uninformed to care about the health risks.[128]

The New York Times discussed disassemblers in "developing countries" as "scavengers who are exposed to toxic elements."[129] Rarely were people working in the informal sector called "workers," though the *Wall Street Journal* did identify informal sector laborers: "Workers, who usually don't wear protective gear, often toss the chemicals that come out during processing into nearby streams and rivers."[130]

Children were often included in photos and videos linked to in articles and in reports. Some children were residents of the neighborhoods where the informal sites were located. These children were described as objects in work areas and in connection with electronic parts and devices, such as "Discarded green circuit boards crack under the feet of children running on dirt paths."[131] But children are also laborers in e-waste disassembly, though they were not discussed as such. When children's labor was mentioned, their actions were included, i.e. "dismantle[ing]" along with the effects of these actions, such as "electronic waste and construction debris containing toxic chemicals are often dismantled by children at great cost to their health.[132]

In contrast to these visceral description, the introduction to a feature about Portland, Oregon based non-profit, Free Geek described similar processes that occurred in the developing world and informal sites, but the description emphasis far more agency to the young American disassemblers:

> teenagers gathered on a warehouse loading dock called the "smash zone." Before a crowd of cheering onlookers, they took baseball bats to their old computer printers and fax machines, breaking them into hundreds of pieces before the remnants were swept into a giant recycling bin. Welcome to Geek Fair 2006. Inside, hundreds of technology aficionados — some in business suits, others in Pink Floyd T-shirts or sporting a Mohawk — competed in video games, tried to "dunk the geek" into a pool of cold water, or just lingered beneath a giant poster of the Linux penguin, the icon of open-source software[133]

A 2011 *CNET* article examines why using manual separation methods is the superior way to get the "pure form of commodity, compared to automated processes." *CNET* highlights Metech Recycling, which was a founding member of the e-stewards certification, and quotes the company's perspective on why paying for electronics recycling "ensure[s] that workers are protected, prison labor isn't used, and the waste is handled in a responsible way. It's also paid to destroy sensitive data, in some cases actually having employees witness data tapes destroyed."[134] The very process that Metech identifies–that manual separation, rather than mass shredding, is the best way to get the purest form of the commodities within electronics–is one of the reasons why the informal sector continues, despite lacking the resources for worker protections and technical infrastructure to ensure environmental safety. It's still a better return on the labor in order to get the commodities.

Supply chains for CE/ICT manufacturing are complex, secretive, and difficult to monitor for environmental and labor rights issues (Meyer, 2011; Moosmayer & Davis, 2016; Sandoval, 2016; Smith & Raphael, 2016). Certification of supply chains for CE/ICT is part of the broader transnational environmental justice strategy (Raphael & Smith, 2016). A 2013 *Wall Street Journal* article about the Chinese government's investigations of Apple's contribution to pollution in China through their manufacturing suppliers, like Foxconn, details pollution of manufacturing areas and health hazards for the predominantly female workforce in electronics manufacturing. The article begins by acknowledging that the impetus for the investigation was due to "allegations by environmental groups." The unnamed groups are indirectly quoted, but only as "alleged." The article directly quotes industry actors like Apple and Foxconn as well as Chinese

government statements. Unlike most articles in the study, this article did include quotes from residents affected by the pollution and one factory worker. The article connects the supply chains investigations to electronics recycling due to the similarity of location and heavy metal pollution of informal electronics disassembly sites.[135] Articles that covered supply chains also discussed labor from extraction–like tin mining for Samsung in Indonesia, which *Wired* described as "dangerous, illegal, and destructive".[136] *Wired* included this description while discussing electronics reuse and repair legislation and the environmental footprint of cellphones, particularly during manufacturing and extraction phases.

5.2.3. Absence and Techniques

The over simplification of e-waste disassembly into either primitive or highly technical labor predominated the twelve years of coverage–but at least the role of labor was discussed. As discussed in chapter four, there was a the lack of workers as sources; this minimal inclusion of workers as voices in media stories contributes to the absence of labor in the processes of electronics disassembly. These absences were reinforced by articles' focus on the techniques of disposal rather than the labor involved, erasing or generalizing about labor locations and not providing context for the economic and structural realities of the informal sites. For example, an article refers to the machines passively being disassembled but does not say by whom:

> If products are recycled rather then dumped, parts of the machines are refurbished for new use where possible; if not, they are disassembled, their glass and precious metals are recycled, and the plastics, which have no reuse market, are often shipped overseas to developing countries for disposal.[137]

The New York Times article has no discussion of what happens with disposal. The Basal Ban is not discussed even though the article is about the regulations and policies happening around the country. The very end of the article names the impacted groups and areas, but it is not very specific and focuses on the incineration rather than the labor and humans involved in processing the waste.

> Nor do they prevent the frequent shipment of plastic shells covered with chemical flame retardants overseas to poor and developing nations; once there, they are often incinerated, because they cannot be reused, and spew toxic chemicals into the air.[138]

Another example is a 2009 *Gizmodo* article which walks readers through a tour of an e-waste recycling factory; no laborers are mentioned–the emphasis is on the machines and the magnitude of the shredding technologies.[139]

In addition to the absence of workers and labor in describing disassembly and disposal sites, articles also erased the locations of the labor, relying on broad generalities or a colonial lens where the developing world is all a similar category of refuse, poverty and unnamed children in piles of computers. A *Gizmodo* article in 2012 featured the work of an e-waste designer/entrepreneur who designed "educational toys that could be operated using discarded electronics" using Arduino microprocessors. The article describes his motivations for the toys and his experiences "passing a mountainous pile of e-waste crawling with children collecting electronic scraps."[140] Nowhere in the article is the location mentioned where this dramatic scene occurred, only that the designer is supposedly from Singapore (he's not). Upon digging further into the designer's website, I found an artist statement that located the scene where the artist had seen the children in the piles of waste as Phnom Penh, Cambodia (Dand, 2016; Ridden, 2012).

5.2.4. Absence and Location

The exporting of e-waste discussed without a specific location reduces the equity and justice that the issue reflects. Sometimes articles said that exports were going to "foreign"[141], "poor"[142] countries or simply "abroad"[143] or "overseas."[144] Other times, articles implied the direction of the flows (i.e. West to East, North to South or developed/industrial to less developed). E-waste could be "exported to the Far East"[145] or sent to "developing countries."[146] One recycling executive was quoted saying, "Recycling is the only option companies have, he said, "unless we want to take a small country in the world and make it into an e-waste landfill.'"[147] While the quote was hopefully a poor attempt at humor, the statement does point to the neocolonial patterns of dumping.

Sometimes an article attempted to acknowledge the justice issues related to toxic flows of waste but missed the opportunity to connect to deeper structural issues. For example, an article noted that the (car) batteries are harmful and that they "are shipped to specialized outposts who deal with them," but does not clarify where these outposts are. The next paragraph discusses toxic flows as "our previous recycling protocol, which was to mail our junk overseas where the restrictions are much more lenient (and harmful)."[148]

Even if more specific locations were used to clarify the directionality of the toxic flows of e-waste exports and imports, assigning responsibility through descriptions of the could avoid assigning blame by using phrases like coverage included descriptions of these flows and responsibility for the waste as: "return-to-sender"[149] process or as a "self cleaning oven"[150] (referencing the exports as to alleviate digital divides).

Another pattern was to not specify the location of where e-waste going, or to minimize the country or region. For example, articles would describe shipping e-waste to

Africa as opposed to shipping waste to Nigeria. *Ars Technica* wrote:

> A trip to Africa in 2010 inspired Wiens to expand iFixit's mission beyond Apple gear. Wiens viewed first-hand how our consumer culture creates mountains of toxic electronic waste from scores of discarded VCRs and computer monitors.[151]

The New York Times said: "Rotterdam, the busiest port in Europe, has unwittingly become Europe's main external garbage chute, a gateway for trash bound for places like China, Indonesia, India and Africa."[152]

The disassembly sites were connected to a U.S.-centric understanding of the global ICT chains. The electronics bazar and markets for reuse in Lagos are called the *Silicon Valley of Lagos*, building off a tradition of connecting media production and labor to the existing Hollywood/Global north context–Hollywood becomes Nollywood in Nigeria, Bollywood in India.

> Most of the equipment sold for reuse by the thousands of electronics dealers in the Ikeja Computer Village, which has been dubbed the Silicon Valley of Lagos, comes from abroad, from the United States, Europe, Asia and the Middle East.[153]

However, these names for the sites are not necessarily a bad thing, what's hidden behind the catchy names is a range of labor and practices often broadly included in the informal sector but constitute extensive knowledge and creativity, yet the media coverage of these sites, overwhelmingly depicted these locations through victimizing lens of pity and horror at the environmental conditions while rarely complicating these narrative with discussions of labor rights, economics and basic needs fulfillment that these informal sites facilitate. Unlike the formal sector, these informal sites were not discussed in terms of job creation, which the next section will discuss.

5.2.5. Labor, Rights and Repair

As the e-waste sector grew, coverage focused on the benefits of the sector, especially jobs. Initially, e-waste disassembly as job creation was initially seen in response to activist criticism of prison labor for electronics recycling. OEMs and media coverage of their responses highlighted that the labor done by prisoners was providing future job training. An example of this messaging tactic is seen in an early *CNET* article focused on prison labor for e-waste disposal in the United States. The article connects prison labor as a way for workers (prisoners) to enter the high tech economy. The article's lead sentence says: "Inmates at a new federal prison in California will soon be able to join the high-tech economy via the burgeoning field of electronics recycling"[154]–as though inmates "can join the high-tech economy" and receive stock options at a start up.

E-waste activists encouraged the job creation argument for the growth of the e-waste sector to "counter [the] arguments made by electronics manufactures that e-waste legislation that includes IPR will lead to financial losses for manufacturers and job losses in regions where IPR is implemented" (Edge, 2011, p. 162) However, though both the informal and formal sectors were covered by the media, when the possibility of jobs was discussed, it was often the formal sector that was creating the jobs, and the formal sector in the United States in particular.

According to Edge's research with e-waste activists, the activists did try "to go beyond pictures of nameless e-waste workers in developing countries and give these workers a name and a voice" (Edge, 2011, p. 161). An activist from SVTC said that:

> What we've really tried to do is give these people a name, kind of interview the people who are actually impacted so they have a voice, so they are able to talk about the fact that they know that they are dealing, some of them, a few of them, know they are dealing with hazardous

> chemicals, and how it can impact their children if anything happens to tem…we've really tried to frame it in a way where people get to know that these people have aspirations and dreams just like the rest of us do" (Interview with lauren Ornelas (sic), SVTC, April 22, 2009, quoted in Edge, 2011, p. 161).

Despite the e-waste activist network's framing intentions, these stories and perspectives infrequently occurred in twelve years of coverage.

Coverage describing the expertise and skills of the workers in the informal sector was rare, as was referring to electronics disassembly work as a livelihood or as employment. More often, when non-U.S. or EU disassembly labor was included in articles, the coverage focused on the visceral environmental disasters that the informal sector workers worked in but failed to account for the people in the pictures. An example of more nuanced environmental justice focused coverage was found in *The Washington Post* in an article from 2010, titled "In Recycling India's E-Waste, Hope and Hazards; Jobs for the Poor: Health, Environmental Risks are Concerns."[155] The article primarily focuses on the labor and economic necessities of the informal disassembly sites in New Delhi and includes a rare reference to activism and organizing by disassemblers, quoting a member of the "Harit Recyclers Association" an Indian NGO who organizes with informal recyclers (Thilak, 2012).

The article speaks to the inherent tensions of transnational struggles for environmental justice while also reflecting some of the patterns of "hyperbolic media coverage" of e-waste (Burrell, 2016). Including the visceral descriptions of poverty, children and old electronics being dismantled "in unlighted, windowless shacks, [by] women [who] use small flames to melt piles of computer cables to retrieve copper" as the beginning to the article and contextualizing the scope of waste in India, the article

examines new regulations planned to formalize e-waste disassembly while addressing delayed dumping problems. While unspecified "critics say the work poses risks to the villagers and the environment" the article turns to examining the impacts of regulations that seek to improve e-waste disassembly and "establish environmentally safe practices" but also disrupt or outlaw the informal disassembly sites. As one of the quoted disassemblers and a representative of the Harit Recyclers Association, says: "The informal recyclers have the skill and experience. It is laudable that the government is trying to save environment and lives, but it should not destroy livelihoods in the process."[156]

In 2012, CNET conducted a lengthy investigation of the life-cycle of an iPhone. Reporter Jay Green wrote a three part series about the working conditions at Apple suppliers, (2012a) and the mines for minerals in phones (Green, 2012b) and the disassembly of iPhones at the end of the cycle. In the third article, "The Environmental Pitfalls At The End Of An Iphone's Life" Green uses the previously discussed Charles Dickens reference to describe the scene of the disassembly site, though he does describe the people in the site as "about a dozen workers, mostly women" acknowledging their labor and employment. [157] The experience and commitment to the investigation seems to have had an impact on Green's reporting, as a year later, CNET ran another article by Green, where he referenced the past investigations (providing prominent links for the series) and described the informal sites as "largely unregulated recycling sites where their dismantling creates hazards that pose risks to laborers who work there and locals who are exposed to the toxic waste."[158] This type of description connects the issues of infrastructure and regulations, refers to people as laborers (not scavengers) and links the

e-waste to other pollution sites–the pollution from the e-waste disassembly harms workers and residents of the area. The article also scored high on both indexes, partially because it described the e-steward certifications fully – including the commitment to not using prison labor (which many articles did not discuss), not exporting to developing countries, and discussed disassembly labor. This article also discussed reuse, noting the complications that reuse and refurbishing bring, using an activist from BAN to define the problem.

Despite this more complicated coverage of e-waste disassembly, the tension between the rights and necessity of disassemblers in the informal sector to work and the need to improve the extensive environmental problems that stem from e-waste disposal was almost never addressed in the twelve years of coverage. Though e-waste network activists did attempt to complicate the media narrative, one of the consequences of the almost total absence of voices and perspectives from the developing world on which coverage focused, was that stories told reinforced the victimhood of the disassemblers and residents of the informal electronics recycling sectors.

Media coverage of e-waste also failed to adequately cover electronics repair and reuse in developed countries as part of e-waste issues–not just dismantling or recycling electronics but repairing them as well. This is also connected to how repair jobs both expand the infrastructure of secondhand electronics and could address digital inequalities. There was one notable exception to the absence of electronics repair in media coverage: when the work of iFixit.org was included in stories. As the codebook details, iFixit was a complicated actor to code as the organization is both a non-profit advocacy organization and a for-profit electronics repair business, but their primary focus has been education

campaigns teaching people how to repair their own devices as well as advocacy campaigns and legal challenges against manufacturers' restrictions on open access to repair/service manuals like those that exist for the automobile repair industry. An example of coverage that iFixit received is from *Gigaom*:

> Wiens, whose job is to dissect gadgets and create easy-to-understand repair guides for users, is passionate about "sustainable technology" or the recyclability of products and their contribution to electronic waste… His attitude is that when products are hard to repair or are not built to last more than two or three years, they are more easily tossed in the landfill, and contribute to e-waste.[159]

The issues of repairable and reusable technologies, copyright, and digital inequalities began to covered more towards the end of the time period. As *Wired* noted in 2013:

> Electronics repair is critically needed to solve the e-waste crisis; it helps bridge the digital divide by keeping secondhand electronics and developing countries' markets alive; and it accounts for hundreds of thousands of jobs in the United States alone.[160]

Increasingly, issues of repair and reuse are becoming policy struggles and a small but growing coalition in the United States have begun, since 2013 to organize around improve the regulatory conditions for repairing electronics (Koebler, 2106; Matchar, 2016; The Repair Association, 2016). These moves have been stymied by OEM/corporate lobbying. For example, there are currently multiple state bills in progress that seek the "right to repair" devices. As the Washington Post reported in 2016, these bills are "opposed by tech giants such as Apple, Cisco and Xerox…[and] would have forced companies to release electronic parts and design manuals to independent repair shops." (Turner, 2016).

It is not surprising that CE/ICT corporations would oppose changing a political-economic framework that currently supports their ability to design obsolescence into their

products. They are dependent upon continued expansion of the consumption of new products. Increasingly, they are also relying on the commodities that they can re-extract from the products that they sell, which is also a way to bolster their positive environmental status (with activists and consumers). As the next section of this chapter details, media coverage of e-waste increasingly focused attention on these concerns through media coverage of the growth of the e-waste sector and sustainable consumerism.

5.3. Sustainable Capitalism: Sustaining Capitalism

While e-waste coverage begins as a tale that exposes the underbelly of globalization and consumer electronics, another story developed through the coverage: the growth of an industry. Rather than the negative implications of injustice surrounding electronics, e-waste issues become reframed as growth opportunities because electronics recycling is a new market, a new sector. The section first looks at portrayals of the growth of the e-waste sector through the gold rush narrative and how neo-colonial relationships of extraction were addressed. I also explore the framing of e-waste disassembly as sustainable mining. I then examine how the business of e-waste was covered–the growth and decline of the sector, ways that industry advocated for itself and how coverage reflects a shifting focus from the environmental justice problems of e-waste to the growth of the private e-waste sector and neoliberal discourse. The section concludes with a discussion about how commodities and supply chains were included in coverage of the e-waste sector.

5.3.1. Gold Rush

A key sub-theme in coverage that examined the growth of the e-waste sector was that e-waste recycling was like mining and that a gold rush of wealth was expected. The gold rush included descriptions of the processes to reclaim commodities like gold, tin, or lead from electronics, discussions of the markets for commodities, and general information about lesser known minerals, or rare earth minerals like neodymium and samarium. The gold rush also explored the environmental benefits of recycling and reclamation and occasionally addressed the colonial and neocolonial relationships embedded in mining and mineral markets.

While e-waste activists note that *The New York Times* article "Technology's Toxic Trash Is Sent To Poor Nations,"[161] published February 25, 2002, is "the story that started it all" (Puckett et al., 2016, p. 85), three days later *The New York Times* published an article titled, "Mining Cellphones, Japan Finds El Dorado."[162] If the first article set the stage for the environmental justice frames that e-waste activists sought to amplify, then the second story sparked the theme of e-waste as a profit making industry, the gold rush. The article focused on Japanese recycling firm Yokohama Metals and referred to an e-waste sector actor as "a Klondike prospector." The article imbued e-waste with both the profit-making potential of gold mining and the magical, fantasy of alchemy, even using the word *alchemy* as the caption to the article's photo, which also said that "about 120,000 phones are needed to produce a one-kilogram gold bar." The article also described the arduous nature of the process, including the fact that it took six months to extract gold from a cell phones, but the same amount of gold took only one month to extract from jewelry.[163]

The article continued the alchemy theme of creating something (money) out of nothing (e-waste) by focusing on motivations for the growth of the informal e-waste sector: "Japan is not alone in trying to squeeze gold from high-tech discards. Across Asia, recyclers are collecting millions of tons of old electronics from the United States and elsewhere and mining them for precious metals."[164] While the emphasis on toxics and the environmental and health hazards of e-waste disposal was covered in the previous article, the El Dorado article does reference the e-waste activists' report "*Exporting Harm: The High-Tech Trashing Of Asia*" (Basel Action Network & Silicon Valley Toxics Coalition, 2002b) which called positive attention to Japan's approach to e-waste recycling and mineral reclamation. *The New York Times* portrays the problem of e-waste as a money making opportunity but not a guaranteed money maker. Almost half of the article discusses how "recycling is a money loser" except for "cellphones and a few other items" and how the industry is dependent upon market prices, which, as will be discussed later, becomes an important element to the collapse of the e-waste sector. The article also ends with a review of the voluntary policies that Japanese cell phone companies had started for cell phone recycling, noting that these pre-emptive programs "give the government less incentive to mandate them."[165]

5.3.2. Mining and Colonial Relationships

Six years after their initial coverage of the gold rush of e-waste, *The New York Times* published a feature article (the longest article in this study) in early 2008 which extensively outlined the e-waste as mining theme.[166] Published one week after the first CES with a "green agenda,"[167] "The Afterlife of Cellphones" article begins by reviewing

the history of mining in the Democratic Republic of Congo (DRC). The article reveals that the largest company working on reclamation of minerals from e-waste is Belgium's Umicore corporation–the same company that ran King Leopold II's brutal mining operations during Belgium's colonial rule of the DRC (formerly known as the Belgium Congo). The article identifies the neocolonial relationship that is inherent in e-waste, noting that "it's a reshuffling of the colonial arrangement: an abundant resource is sent from richer countries to poorer ones, made into goods, then sent back. That resource is our garbage." *The New York Times* quotes Umicore's definition of the work "as aboveground mining" and reinforces the division between clean, proper "impressive" e-waste formal sector sites as opposed the informal sites that activists keep drawing attention to.[168]

But this review of the colonial relationships connected to mining and mineral reclamation through e-waste was a rare occurrence in the 12 years of coverage. There was also no context of the history of colonialism and development–how the forced extraction of people and resources of the African continent reduced modern abilities to develop infrastructure. Stories rarely discussed the companies involved processing the metals and minerals in reclamation, though an early *CNET* article mentions Noranda as HP's partner that processes the metals from HPs recycling operations.[169]

Part of the gold rush and e-waste mining theme also focused on the commodity market for minerals, especially rare earth minerals like neodymium and samarium. Some degree of reader education was included, for rare earth minerals were a relatively new concept. For example, in 2011, *The New York Times* discussed the rising prices of rare earth commodities and explained the significance of rare earth minerals as "metallic

elements needed for many of the most sophisticated civilian and military technologies, whether smart phones or smart bombs." The article also listed the mineral and its product form, such as "Neodymium: headphones and hybrid electric cars; Samarium, "crucial to the manufacture of missiles."[170]

In 2011, *The New York Times* also discussed Umicore, but only as a review of the company's recent activities and plans to open a new recycling plant in Belgium.[171] In 2012, the *Wall Street Journal* profiled Boliden AB of Sweden, which as of 2012 would become "the world's biggest recycler of electronic goods." The article focuses on the reclamation of gold from electronics, noting that Boliden AB "produces eight tons of the metal, valued at about $430 million, from electronic scrap every year. Ton for ton, that makes scrap a far richer source than mine deposits for the company."[172] While the focus of these stories was that companies were saving money by reclaiming the existing minerals rather than extracting raw materials, the environmental benefits of reducing extraction was also discussed.

5.3.3. "Green Gold"

In the 2008 long form feature, "The afterlife of cellphones," *The New York Times* highlighted the idea that e-waste recycling as mining is less environmentally damaging than original extraction needed to produce electronics, noting, for example, that "mining the gold … for the circuit board of a single mobile phone generates 220 pounds of waste." Gold collected through e-waste "is recycled gold," and is, thus, "green gold" according to the Umicore manager quoted in the article. The article continues the alchemy theme, saying, "Recycling feels good because we imagine it as just this kind of

alchemy–which Umicore achieves with impressive environmental controls."[173] The environmental benefits of mineral reclamation through recycling were discussed by *CNET* in 2012. The article notes "35,000 pounds of copper, 772 pounds of silver, 75 pounds of gold, and 33 pounds of palladium--resources we won't have to dig up fresh from a mine."[174]

The gold rush/e-waste as alchemic profit making potential theme, while led by *The New York Times*, was discussed in a variety of ways that expanded the gold rush imagery. While *The New York Times* saw recyclers as "squeezing gold,"[175] *CNET* discussed e-waste recycling as being like the children's tale Rumpelstiltskin, where recyclers "spun into precious metals and plastic containers."[176] The concept of "urban mining" appears in 2008 with *Gizmodo* reviewing other coverage of Japan's growing industry. This article also includes links to *Gizmodo*'s coverage of the informal sector in China that the e-waste activist reports called attention to, but the article minimizes the environmental and social injustice elements of the story to pull readers to the e-waste as gold theme. Shortly after the economic collapse in 2008, *Wired* began a long article that laid out the economic motivations of the e-waste prospectors:

> There's gold in them thar PCs–not to mention silver, copper, aluminum and other valuable recyclables. That fact, not a desire to save the planet, is now pushing the tech industry toward "greener" manufacturing and recycling practices.[177]

5.3.4. E-Waste Sector Growth and Collapse

The hunt for gold through electronics recycling was not the only reason given for the growth the e-waste sector–regulations, or the threat of regulations was also a pattern in media coverage. Though increased regulations were a goal of e-waste activists, one

reason given for the growth of the e-waste sector/market was regulations or the possibility of regulations. In 2004, the *Wall Street Journal* noted that the e-waste sector was growing, especially as regulations expanded to increase OEM accountability and responsibility:

> Much of the world's electronic junk ends up choking landfills in developing countries. But e-waste recycling is a growth market, as countries around the world move to make manufacturers more accountable for their products when they fall out of use and into the global waste stream.[178]

The same year they also covered CTIA's opposition to states' legislation proposals, helping CTIA to promote their reframing of e-waste issues as a consumer education issue not a regulatory problem.

> "There is an educational process that we could be more involved in to make people more aware of the importance of recycling and the opportunity to recycle as well," says John Walls, a CTIA spokesman.[179]

Notice that consumers are being given an *opportunity* to recycle which is way to individualize a larger structural problem and reflects the same approach that KAB and early industry public relations used when messaging about environmental issues.
But the resistance to regulation was also supported by the neoliberal priorities of the executive branch of the U.S. Government during the same time period. E-waste activists reflecting on the strategies and planning for the Toxic Dude campaign acknowledged that: "The CTBC member organizations recognized that the prospects of an EPR solution coming from the top down at the start of the George.W. Bush years in 2000 were virtually nonexistent." (Wood & Schneider, 2006, p. 287)

The activists were unfortunately correct in their understanding of the Bush administration's commitment to neoliberal regulatory approaches, which *The New York*

Times highlighted in 2005: "The federal government, through the Environmental Protection Agency, says it is pursuing a two-pronged strategy -- making the public aware of what it can do and working with manufacturers."[180] Basically, the Administration aimed to do as little as possible. *The Washington Post* reported that the acting assistant administrator for EPA's office of solid waste and emergency response, Thomas Dunne, told "a group of recyclers and manufacturers that he sees himself as 'more of a facilitator and less of a regulator'" and that he "said in an interview he has no plans to pursue new rules or legislation."[181]

As Raphael and Smith expanded upon the e-waste activist network's reflection about the anti-regulatory climate of the early 21st century. They note that:

> NGOs faced the challenge of the need to grow acceptance of producer responsibility in arid political soil. In the United States historically pro-business regulatory context, federal regulators already had imposed a kind of *conceptual tariff on the idea* [emphasis added] of producer responsibility as it entered the country (Raphael & Smith, 2006, p. 250)

The *conceptual tariff* reflects scholarship about neoliberalism and hegemony – the very idea of a regulatory system for e-waste was already restricted because as Harvey has said, "neoliberalism has … become hegemonic as a mode of discourse" (Harvey, 2005, p. 3). E-waste activists incorporated this understanding of the hegemony of neoliberal government and focused much of their policy campaigns on state legislation.

However, just because the federal government was a limited *political soil*, it does not mean that there was not space for the market in the federal government, especially as the private infrastructure of the e-waste sector expanded. *CNET* observed this in 2004, "Dell Sees Green in EPA Computer, Recycling Pact"[182] where they report about Dell's

contract with the US government for recycling electronics and leasing computers.

By 2008 the *Wall Street Journal* was still focusing on the role of regulations in the growth of the e-waste sector, but had shifted their attention to the economic potential of the "business of reconstruction," discussing a range of industries benefiting from the trend of increased state level regulations, highlighting how regulations about electronic waste disposal are helping businesses, and noting that as of 2008,

> It is not just consumer interest that is driving the growth of this market. State governments across the U.S. are implementing laws and guidelines that benefit companies engaged in product reconstruction. For instance, nearly 30 states have introduced legislation that calls for recycling electronic waste to keep it out of landfills.[183]

In 2007 "a buying binge" by recycler companies began the sector consolidation of smaller operations by global providers, which, as *IDG* noted, related to issues of transportation and disposal costs. The larger companies sought to "acquir[e] local providers to expand their reach" because it is cheaper to ship e-waste shorter distances to recycling facilities.[184] In 2008, "investment in material recycling–including electronics–reached $252.4 million …, up from $75.5 million the year before" (Kemper, 2009).

By 2010, articles claim that shifts in consumer behavior are contributing to the growth of the e-waste sector; people have become more comfortable with used electronics. As *CNET* reported, "these services reflect how more businesses are trying to make money by tapping into the giant e-waste stream we produce and consumers' increasing willingness to deal with used electronics."[185]

The New York Times reported in 2008 that e-waste recycling offered entrepreneurs opportunities as a new market for investments by venture capital. The article even uses the fact of the growth of e-waste amounts as why companies could make

money: “This so-called e-waste is the fastest-growing part of the municipal waste stream and, depending on your outlook, either an enormous problem or a bonanza.”[186] Articles would focus on one recycling company, repeatedly, often emphasizing the corporate partnerships that company had achieved. ReCelluar might be the poster child of this trend; articles often used the company’s success as evidence of the growth of the e-waste sector–but later the company failed completely. EcoATM also received attention, especially when the company received venture capital money. One such article was *Ars Technica*’s 2011 piece titled, “Ecoatm Raises $17m for Nationwide Rollout Of E-Waste Kiosks.”[187]

One pattern of articles about the e-waste sector and the growth of businesses was a focus on descriptions or profiles of entrepreneurs and owners. These articles tended towards charming descriptions of the owners or entrepreneurs of new e-waste recycling companies. *The New York Times* described the CEO of Collective Good, Seth Hein, as “a whip-smart and mildly self-righteous environmentalist with an M.B.A. and a boyish love of sports cars.”[188] *The Washington Post* featured a profile of the CEO of “RetroBox -- headed by a cheerful Harvard Business School graduate named Stampp Corbin, who sees America's high-tech rejects as a healthy revenue stream.”[189] However by the end of 2005, Corbin sold the company to Intechra, which was later, in 2010, bought by US Arrow Electronics (Resource Recycling, 2010).

Despite the dreams of the e-waste prospectors, the early observations of the risks of electronics recycling in *The New York Times* “El Dorado” article played out accordingly. The e-waste sector’s profits were directly tied to commodity pricing. As the price of key commodities reclaimed through e-waste fell, the e-waste sector began to

collapse. The situation was also connected to the reduction of certain types of recycling capabilities, like CRT recycling plants. In a front page article in March 2013, *The New York Times* shifted tone; the e-waste sector was no longer the gold rush. The article reported that:

> A little over a decade ago, there were at least 12 plants in the United States and 13 more worldwide that were taking these old televisions and monitors and using the cathode ray tube glass to produce new tubes. But now, there are only two plants in India doing this work.[190]

The article also discusses the dramatic pricing decreases for commodities, particularly the glass from CRT monitors, which were earning about $200 per ton in 2004 . By 2013, recyclers had "to pay more than $200 a ton to get anyone to take the glass off their hands."[191]

Surprisingly, this downward spiral of the industry seemed to catch people off guard. In 2012, ReCellular –a recycling company featured throughout coverage, and the phone recycler for large wireless carriers like AT&T, Verizon and Sprint, as well as retailers like Costco and Best Buy–was described by *CNET* as a "recycling and resale titan."[192] By 2013, ReCellular was bankrupt. In 2013 the sector shrinkage was discussed; for instance, as how "electronics recyclers have already begun mass-shredding functional phones because they can't resell them internationally."[193] However, rather than address the structural issues surrounding commodity markets and the monetization of environmental problems, coverage directed attention back to regulations. For example, in 2013, the New York Times reported that the collapse of the sector was because:

> State and federal environmental policies have also become victims of their own success. Over the past decade, environmental regulators have promoted "take-back" programs to persuade people to hand in the more than 200 million old televisions and broken computer monitors that

> Americans are thought to have stored away in closets, garages and basements.[194]

This also redirects attention from the environmental activism that had worked to pass the legislations and policies. It makes it seem like only environmental regulators worked to make the regulations.

5.3.5. Cash For Devices

Recycling electronics for money is a key part of how the e-waste sector develops. The sector relies in part on consumers turning in their electronics so that the e-waste companies can collect the raw materials inside the electronics and sell the remaining materials to other waste dealers. How the media dealt with this aspect of e-waste evolved over time. Articles focused on the investment and development of new businesses in the e-waste sector. Selling devices for money was also used by news outlets to direct readers to how they could help or recycle their electronics, providing in some cases promotion of private e-waste recyclers. Many times this information about how to earn money by recycling, trading-in or upcycling a device was contained in the how-to sections of articles.

How-to sections helped to minimize environmental justice concerns about e-waste disposal. An *Ars Technica* article in August 2012 is a good example of the how-to format and the minimizing of environmental justice, activism and politics concerns. The article notes that, "many of the buyers waiting to buy your stuff were just other recycling or refurbishing companies, but unless you care deeply about what ends up happening to your precious MacBook, this doesn't seem to be much of a speed bump."[195] The context and problems of e-waste are erased as it just becomes a consumer transaction, the mere buying and selling devices.

Activists tried to raise concerns about the ways reuse programs contributing to e-waste through delayed dumping rather then eliminating digital inequalities. *The Digital Dump* report raised this issue in late 2005, But as buy-back programs expanded and began to be discussed as a alternative money-making activity, the concerns became minimized. For example, a *CNET* article from 2012 noted,

> The incentive is twofold. First, why let perfectly good parts go to waste when there's plenty of money to be made? Second, drumming up support from consumers puts unwanted phones in the right hands so they can cycle back through the market and stay out of landfill.[196]

There is awareness that putting the devices in a landfill is no longer an option, but whose hands are the right hands? While there was an emphasis on the environmental and justice issues associated with why it mattered how and where a device is recycled, there were noticeable shifts in tone as the economic collapse/great recession occurred. The environmental issues took a back seat to economic necessity, and articles encouraged readers to see their used electronics as a possible source of income by earning money by recycling devices.[197]

A *CNET* article from 2008 also demonstrates this pattern in a review of options on how to earn money from one's old electronics. The article notes that the "All of these companies will delete personal data from your devices and pledge not to ship items overseas for unregulated recycling" but offers little context as to why that pledge might be important. Instead, it is focused on how to earn money from the used devices. The article uses *pledge* twice; the result is that the significance of the certification and e-stewards *pledge* seems minimized: "Many Web sites pledge to pay you for mailing in used electronics. Which ones look the most lucrative?"[198]

Another way of discussing the money making opportunities from "cleaning out

the old junk drawer" is to frame it as "comparison shopping if you want money for your old products." Despite a little self-reflection early in the article about the entwined relationship of technology reporters to the products they cover, this how-to recycle article from the *Wall Street Journal* in August 2008, focuses on how individuals can earn the most money for devices, with some concerns about personal data. The article's first paragraph begins:

> It's a fact of life and one of the reasons I have a job: digital electronics will eventually break or get replaced. But it's hard to know just what to do with the gadgets that get left behind. Some people stuff them in junk drawers. Others want to donate or recycle their old electronics, but worry about compromising private data. And plenty of people want some monetary compensation.

The lengthy article (over 1200 words) reviews four different for-profit electronics recyclers but includes no discussion of where the electronics recyclers will take the devices or how they recycle or dispose of them; thus, there is no connection to issues of environmental justice Additionally, the article concludes with a plug for the CE/ICT's industry's lobbying organization, directing readers to use CEA's website because it is a "useful resource for general electronics recycling." [199]

The focus on earning money from devices gives an out for people who don't care to consider the health and environmental consequences of electronics. A *CNET* article took a moment to highlight this motivation for recycling electronics: "Even if you don't consider the health and environmental impact of e-waste, it's worth looking into a take-back or resale program to get the residual value from your gadgets."[200] The how-to recycle/profit from used electronics articles tended to provide little information about the certifications programs and policies of the various recycling programs, especially those

associated with large retail chains like Best Buy.

5.3.6. E-scrap and Supply Chains

In the articles, e-waste sector descriptions varied, and those variances point to some of the differences among recycling, refurbishing, sustainability programs and trade in programs. Sometimes the device was emphasized such as when *IDG* said that e-waste recycling programs are "user-facing initiatives like PDA recycling."[201] While often the terms focused on the commodity elements and emphasized the new market nature of the sector. *IDG* (2007) called recyclers "asset recovery providers" and "e-waste recovery."[202] *The New York Times* noted the marketing nature of the changing terminology for the e-waste sector, discussing "urban mining" as a "voguish term."[203] The word scrap, or "electronic scrap,"[204] is used throughout coverage, especially in articles where the profit-making potential of e-waste is covered.[205] Instead of becoming waste or garbage, obsolete equipment is now scrap–as Van Loon noted, "there is more use-value to [the] waste than is currently exploited" (p. 116). The term *e-scrap* has replaced *e-waste* in terms of industry language. Resource Recycling is an industry publisher of the trade journal, "E-Scrap News"(Resource Recycling, 2017b) who also runs the one of largest and longest running industry conferences, "E-Scrap: Where the Electronics Recycling Industry Meets" (Resource Recycling, 2017a). The removal the word *waste* from the discourse of electronics disposal also reflects the trends that garbage and waste scholarship identifies, in that the word waste symbolizes that waste management systems have failed, thus by reframing the e-waste sector to e-scrap the connotation of this failure is lessened (Seale, 2016).

Connecting e-waste sector activities to the product life cycle and supply chains of electronics was also a pattern. The *Wall Street Journal* discussed the sector as part of the "business of reconstruction" in an article which defines recycling, refurbishing, and remanufacturing.[206] *IDG* also emphasized this angle with the phrase, "remarketing" to describe activities.[207] Electronic waste could be recycled or repurposed.[208] The actual material of electronic waste was discussed in terms of "cathode ray tubes and other unsafe byproducts of the U.S. technology industry"[209] and "toxic trash."[210] According to *Gizmodo*, the manufacturers were reusing "the good bits" of electronics.[211] By 2011, *CNET* uses the term "demanufacturing" to describe the activities of the e-waste sector.[212] Rarely was the word *reuse* used, but one article in *The Washington Post*, an article written by the author of a popular press book about electronic waste (Elizabeth Grossman), did refer to part of the e-waste sector as "the reuse market."[213]

The relationships between supply chains, commodities and regulations that might possibly improve labor and environmental conditions were not discussed very often, though there were occasional signposts of what some possible trajectories for the future of mineral commodities for electronics, such in 2011 when *The New York Times* quoted a market analysis discussing lithium, which is used for batteries in many CE/ICT products:

> "You can count on a constant and growing thirst for metals including lithium," said P.Aswin Kumar, an analyst with Frost & Sullivan. "But lithium still costs about five times more to recycle than to mine, so environmental laws will drive recycling for now."[214]

Or in 2012 when The *Wall Street Journal* quoted a manager from Boliden AB, who predicted that "recycling will increase as industry looks for new sources of raw materials and societies face growing waste heaps."[215] The commodity market contributed to the decline and consolidation of the e-waste sector. However, as the recycling industry and

global industry more generally seems to be inching slowly towards a consensus around the "circular economy" in which even the notoriously anti-environment/climate change denying U.S. Chamber of Commerce sees waste as key area of "monetization," these trends of the CE/ICT supply chain sector merit watching (Bowdish, 2016, p. 1). As of 2011, it was still more expensive to recycle lithium than collect it through raw extraction, thus, as the gold rush theme discussed, when the profit potential is gone, recycling to conserve resources becomes a low priority. Laws and regulations are needed because capitalism, ultimately, as the next section will discuss, is a system not concerned about the environment, unless there is profit to be made.

5.4. Sustainable Capitalism: Consuming Justice

According to the Computer Take Back Campaign's analysis of their own early framing strategies, "cultural consonance" means that

> successful environmental frames are presented in ways that resonate with existing culture and beliefs. A full-frontal assault on the dominant political economic paradigm of the United States, on its is widespread faith in technological progress, markets, and economic growth, would likely be dismissed in public discourse. (Raphael & Smith, 2006, p. 253)

The e-waste activist network did not focus extensively on critiquing mass consumption/consumerism, due to their reliance upon environmental claims making approaches that prioritized *cultural consonance* for messaging and framing strategies. If activists did not actively communicate critiques of consumerism in their campaigns about e-waste, an environmental justice issue clearly tied to mass consumption, how did media coverage reflect consumerism? This section expands from the previous discussion of the growth the e-waste sector and explores how the CE/ICT industry responded to e-

waste as an environmental and social reputation issue. The reduction of toxins and harmful materials from CE/ICT products was and is an environmental justice goal; it was also a specific messaging strategy by activists in their market based campaigns against OEMs like Apple and HP.

After first looking at how media coverage discussed product design and the greening of CE/ICT, I then look at the economic motivations and messaging about green product design in e-waste news coverage, connecting these issues to the ways that media coverage explicitly encouraged CE/ICT consumption and the growth of the green IT market. Following this I explore another industry reframing and response to e-waste and CE/ICT consumption: using reductions in energy consumption of consumer devices to elevate sustainable consumerism. I conclude this discussion with a brief review of how media coverage of e-waste reflected greenwashing, particularly during Earth Day month. The section then discusses imagery of e-waste, obsolescence and consumption, exploring how media coverage amplified apocalyptic and anthropomorphic language to describe electronics and consumerism. I then explore the degree to which critiques of consumerism and planned obsolescence appeared in coverage, looking at how devices and upgrade cycles and trade-in programs were discussed. I conclude the chapter with a discussion of how coverage addressed responsibility, blame and injustice.

5.4.1. Green Design, Green Profit

As discussed in chapter four, the green IT topic index did not show a strong coherent green or environmental message in the coverage. However, green design did become more dominant in coverage as the focus shifted towards individual producers and

reputation management through sustainability programs. Branding is connected to better design–for example, small changes connected with logos actually had big impacts in terms of recyclability, such as when HP changed the glue and material that attached their logo to printers. Green design offered positive news stories about how much better design is getting at addressing concerns about toxics and recyclability, such as when *The New York Times* says: "The electronics industry is greening significantly, though."[216]

Articles discussed how packaging reduction contributes less carbon output and "saves … money on logistics and materials."[217] Occasionally some design issues or chemical reductions were discussed as features; for example, the Motorola Renew phone, a carbon neutral phone where the manufacturer pays for carbon offsets, includes an envelope for recycling and "is also free of polyvinyl chloride, asbestos, chlorofluorocarbons and halons." *The New York Times* ran the short article promoting the Motorola Renew phone as pretty much a straight press release: no other actors other than Motorola are included in the article. The article begins with some of the contextual information about the scope of e-waste problems and toxics in electronics but focuses on highlighting the supposedly green cell phone, claiming that "You can get it in any color you want, as long as it's green."[218] Improved design also had cost benefits. As *IDG* noted, the priority was money:

> Those all-important greenbacks -- in the form of lower energy bills, ROI, and tax breaks -- are driving many companies toward more eco-responsible, waste-reducing, sustainable IT initiatives.[219]

This same article from 2007 relied on a *IDG* sponsored "Green Computer Research Report," a survey which, according to *IDG*, showed that:

> the underlying motive appears to be protecting the bottom line more so

> than protecting Mother Nature: Almost three-quarters, 74 percent, of companies adopting green computing are doing so to reduce energy costs.[220]

Green design articles also revealed the economic motivations behind the expansion of green product design. In 2006 *The New York Times* examined some of the innovations and challenges that industry faces in removing toxics from products, but the inclusion of industry quotes highlights that the economic motivation behind green product design is key. For example:

> While Hewlett continues to develop products with some parts made of recycled plastics, for now it has shelved its biomass-based product research and development. "We must have a valid business reason for doing things, not just an environmental reason," Mr. Frey said. [221]

In 2007, *USA Today* ran a very long feature article on green design and challenges for OEMs. The article demonstrates how including more activist perspectives brings more context to the story and offers good information on technical issues and how product design relates to refurbishing and recycling. The article's opening sentence highlights the fact that electronics have toxics: "The Dell Latitude D630 laptop contains mercury, a heavy metal that can damage the human nervous system." The article's next four paragraphs then describe how toxic and bad for the environment the laptop is–how it isn't made of recycled plastics, the packaging is terrible/not made of recyclables, but also that "it may be the most environmentally friendly mainstream laptop on the planet." These first paragraphs also include only activist quotes. As the article continues the focus shifts towards companies promoting their green initiatives and industry perspectives like "going green isn't easy" and how "PC and electronics-makers are making progress" as well how "It's hard to judge if most buyers consider the environment when buying electronics." Towards the end of the article, the attention returns to activist critiques and

concerns and draws attention to the problems of supply chain invisibility, noting that:

> Oversight of these subcontractors can be lax, and most manufacturers won't even say who their subcontractors are. Sun made a rare exception for this story, providing the names of three vendors -- Solectron, Celestica and Flextronics -- that all adhere to an environmental code.[222]

The combination of length and foregrounding activist perspectives in the article meant that the *USA Today* piece drew attention to some of the complexities of e-waste issues while still keeping attention to environmental justice.

5.4.2. Green Markets: CES and Energy

Unfortunately, this complex coverage that USA Today included was the exception. As coverage increasingly included the product design topic, articles became focused the economic motivations behind product design improvements and more importantly, who is the audience for green electronics? This also coincided with the 2008 CES being marketed as the first *green* CES. Coverage of the 2008 CES addressed this and the growing industry developing around green product design. *The Washington Post*'s article about the greening of CES, entitled, "Fighting Reputation of Waste, Electronics Show Goes Green" seems to offer criticism by identifying public relations strategies and reputation management in the title and by including statements such as: "It's part of a broader public relations campaign to mitigate the industry's reputation as an energy-guzzling business that produces gizmos that aren't easily recycled." But the last half of the article is spent discussing the *green* features of CES event and focuses on the corporate turf battles over who may become the greener technology company. The article is promotional in tone, using only experts or companies' own spokespeople as sources, for example:

> Efforts to be more eco-friendly will likely extend to many of the 2,700 exhibitors trying to sell their products to consumers willing to pay a premium for sustainable devices, said Albert Lin, an analyst with American Technology Research and a veteran of CES.[223]

Environmental concerns were seen as a niche market in 2009, according the market analyst and experts quoted by *The New York Times*, for example: "'This is absolutely a niche product and niche market and niche audience,'' said Mr. Byrd, the CCS analyst."[224] By 2010, *CNET* discussed CES as a marker of green diffusion in consumer electronics and continued the pattern of highlighting industry perspectives about the growth potential of the green IT market, noting that "energy-efficiency … appeal[s] to a much broader audience" and that companies view **"**energy as a long-term business opportunity, and not one that only caters to a niche of hard-core eco-minded consumers."[225]

While there was some attention to energy consumption and conservation at the manufacturing phase of CE/ICTs (though not necessarily at the extraction phase of materials to make electronics, one of the most energy consuming and CO2 producing phases of the product lifecycle), the general trend of greening CE/ICT tended to focus on reducing the energy consumption of devices. Coverage focused on the savings available to consumers and users wanting more energy efficient devices; there was less attention to connection of energy conservation to the climate change. The same *USA Today* article that offered more complex coverage of e-waste and environmental justice quoted an e-waste activist saying, "'Companies would much rather talk about energy' than almost any other environmental topic." The article further notes this is "because saving energy saves money, something customers love."[226] Articles continued to highlight OEMs and industry perspectives that stressed this message, such as *The New York Times* quoting a Nokia spokesperson,

> "Recycling is very important and we continue to do a lot there, but there are also real opportunities with energy efficiency and creating services that help people make more sustainable choices," said Kirsi Sormunen, Nokia's vice president in charge of environmental affairs.[227]

Or *CNET* quoting a Panasonic spokesperson:

> "Consumer electronics is a fairly mature area and we're looking for new areas of growth, and energy fits into that category," said Mark Sharp, a group manager in the corporate environmental department of Panasonic North America.[228]

While the 2008 CES conference was a key moment of greenwashing saturation for CE/ICT, every April also presented opportunities to improve the environmental reputation of OEMs. Earth Day officially is April 22–the day of the first large demonstration about the environment in Washington, D.C. in 1970. But Earth Day and attention to the environment, like women's issues during March or Black history month during February, has become its own industry of reputation management and environmental education.

Coverage of e-waste during Earth Day and the surrounding month of April was used as a press opportunity for companies to highlight their *greening* activities, as though Earth Day is a magical salve that can heal all past environmental guilt. Early CNET coverage was particularly ripe for the inclusion of these promotions. In the beginning of April 2003, CNET covered Dell's announcements about their recycling goals, "Dell to set PC recycling goals."[229] On April 22 (the official Earth Day) CNET ran an article titled "Recycling not easy for PC makers" and noted that "as another Earth Day rolls around, looming regulations are prompting companies to devote more resources to establishing programs to recycle existing products." The article links to a now dead link about an e-waste bill, but these bills were not sponsored just because it was Earth Day. The regulations "are prompting companies to devote more resources to establishing programs

to recycle existing products" not because of activism, public pressure, or even reputation risks.[230]

In 2004, CNET covered HP's recycling efforts right before April began, with an article published at the end of March titled, "HP bolsters earth day recycle offer."[231] Later in the month of April, they did expand their coverage with a longer article that, while it including mostly self-reported information from OEMs about recycling rates and programs, did include some discussion of shareholder activism. But they continued to reinforce the erasure of activism and public pressure, emphasizing that Earth Day, not the range of criticism and activism around the issues, was the reason for a company's increase in recycling and regulations:

> With Earth Day just around the corner, Dell and other PC companies are stepping up their efforts to recycle old computing gear that businesses and consumers have been sitting on for years. [232]

IDG also used the promotional aspect of Earth Day to generate coverage, including an article in 2005 titled, "HP Celebrates Earth Day; In Honor of the Day Devoted to All Things Earth-Healthy, HP Offers a Limited-Time 50-Percent Discount On Its Recycling Services. And Then Some."[233] Earth Day was also used to promote e-waste collection events, such as:

> Since the first Earth Day in 1970, tree-planting and trash pickup have been traditions, but many of this year's celebrations had new twists: Collecting old electronic gear to avoid disposal in landfills. The Environmental Protection Agency's Midwest office, for example, is trying to collect 1 million pounds of such 'e-waste.'[234]

While the majority of Earth Day related articles reflected the promotional aspect, there was an educational value to the collection events: they were part of the overall process that occurred over the 12 years of coverage to define *e-waste*, which as discussed earlier,

is increasingly being renamed (at least by industry) as e-scrap. But especially during the earlier period of coverage, the term e-waste had to be introduced to the general public, like the example above does: *of such 'e-waste.'* According to e-waste activists accounts, the term *e-waste* was "popularized by U.S. activists and adopted widely in the media, reversed the public perception of Internet-age progress in all things by suggesting the environmental and health consequences of the thruway tools of e-mail and e-commerce" (Raphael & Smith, 2006, p. 255). The next section explores how the term evolved from an ironic commentary on fantasy of immateriality to the more visceral descriptions of waste and consumption that media coverage depicted.

5.4.3. Imagining Obsolescence and Consumption

Apocalyptic and anthropomorphic language was found throughout coverage of e-waste. Electronics, like humans, are born and die. They become as *The New York Times* said, "last year's model almost the moment it is born."[235] Devices were "electronic carcasses."[236] An e-waste activist was quoted calling the amounts of exported e-waste "a hemorrhage,"[237]/ while *Wired* titled an article "Every computer poops."[238] Not only are devices described like bodies, but they also have spiritual paths. Some are better than others; for instance, one article describes "the equipment's eventual safe and environmentally sound journey into the cyber afterlife*."* [15003]. *The New York Times*'s coverage is particularly invested in this metaphor, starting in 2005 with an article titled, "Afterlife for old computers is envisioned in Council bill"[239] where a policy discussion for the state law about electronics recycling references the spiritual metaphor for disposal options. *The New York Times* extended this with their long form article titled "The

Afterlife of Cellphones," whereby "hell" is the informal disposal sites dismantled by workers in developing countries–as though the devices have sinned and are sentenced to be dismantled in horrific conditions. Also included in the hell level are smelters and formal recycling at plants run by Umicore. Purgatory is the refurbishing and reuse e-waste operations, but "There is no heaven for cellphones. Wherever they go, it seems that something, somewhere, to some extent always ends up being damaged or depleted."[240] *The New York Times* followed this article with an editorial titled, "A hazardous afterlife."[241] Cellphones could "be put out to pasture,"[242] and e-waste sites were "graveyards."[243] Devices that were old but still functioning were likened to Frankenstein, half dead/hybrid technological monsters–for instance, the "I Call Him FrankenPod" subhead in a *Gizmodo* article.[244] By 2012, the *afterlife* references the reuse and refurbishing of electronic products: "Your smartphone's secret afterlife (smartphones unlocked),"[245] *Hell* is specifically used for informal electronics disposal sites in less developed regions, such as in *Gizmodo's* article "E-hell on earth: Where the West's electronics go to die."[246] The spiritual and death metaphors refer to the life cycle of the products but also to consumption and obsolescence, without needing to specify those topics. Similar to the hell landscape and other spiritual images, devices were also described in animalistic ways. Some were scary or threatening animals: "power cords, coiled like snakes."[247]

Body references were also found in descriptions of and references to consumption, as in, there was a *hunger* for more electronics. *Gizmodo* reflects this technophilia most specifically with an article about the 2008 CES events:

> As CES 2008 comes to an end and we wipe the gadget drool from our collective chins…damn it's depressing to see that pile of electronic

> carcasses, our fetish of choice, piled high in phallus-shriveling obsoleteness.[248]

Gizmodo connects obsolescence and images of e-waste as inspiring impotence. The connection to sexual desire as part of consumption follows another pattern of describing devices–the lust and desire for more/new devices. Lust for gadgets and devices was also discussed as temptation: "In today's high-tech era, the temptation for upgrades is everywhere: a slimmer cell phone, a sleeker desktop, a sportier BlackBerry."[249] This example from *The Washington Post* also reflects the alliterative descriptions that can also describe bodies (or cars)–sleeker, slimmer, sportier. The lustful, tempting, addictive nature of the device consumption was also self-identified by writers, or "other tech junkies."[250] Consumption of electronics was likened to hunting, competition, racing, or a "constant quest for better gadgetry."[251] Digital metaphors were used to talk about consumption of electronics–as in to refresh one's gadgets like a webpage.[252]

Devices were discussed in terms of use and time. When obsolescence and upgrading were discussed, the emphasis was on the usefulness of the device – but usefulness is a fairly loose category. Descriptions of the old devices noted the devices were "outdated" and "no longer useful"[253] or talked about "when their useful life ends."[254] Devices were also "junkers"[255] and were "outdated," "dusty", "devices of yore"[256] "dead toys"[257] and "rusty, broken-down gadgets."[258] But these descriptions do not address the consumption element of upgrading, fashions and trends. The assumption is that readers will upgrade: "After all, what are you going to do when next year's model comes along?"[259]

When upgrade cycles or trade-in programs are discussed, articles rely on market experts or industry to self-explain, but these actors offer little critical voice and tend to

focus on individual problems (and solutions). For example, the long form *The New York Times* article "The Afterlife of Cellphones" interviewed industry experts, like a Motorola psychology researcher who suggests that devices and upgrading is an extension of the self. As the article's author says, "it's because we've made phones such deep and indispensable extensions of ourselves that we dump them so quickly. Who can bear seeing himself as even slightly outdated or incapable?" The article also publicized the work of Jonathan Chapman and his theories of "emotionally durable design," which is described through quotes from the book and Chapman:

> 'Somewhere during the last 100 years, we learned to find refuge outside the species, in the silent embrace of manufactured objects,'… But designers and consumers have snared themselves in an unsustainable trap, Chapman told me, since our affection for many high-tech objects is tied exclusively to their newness.[260]

The emotional connection to devices was addressed by the *Associated Press* which touched on the connection between obsolescence and the value of the devices–the reason that some people do not get rid of their devices is that they have placed emotional value of the device and how the device seems to/should have value but doesn't (emotional design).

> But if the used phones on display at a typical tag sale are any indication, many seem to prefer a drawer as at least a temporary resting place– possibly because they may worry about pollution, or perhaps they simply find it hard to fathom how a cell phone that worked perfectly fine just yesterday is suddenly worthless.[261]

A local waste department director was quoted by *The New York Times*, saying "people seem to think there's something criminal about throwing away a computer because they paid so much for it."[262] Thus they store their old devices rather than recycling or getting them reused/remanufactured. *Gizmodo* even offers the theory that deepening the

emotional connection is a possible solution to over-consumption of new devices because, "If we all try to love our gadgets, to start treating them more like companions than disposable tools, a lot more perfectly good gear could be saved from an untimely retirement."[263]

When coverage dealt with obsolescence, it focused on how the devices are given more value by owners due to the emotional connection to the device. This impacts how and when people recycle their devices and contributes to the stockpiling of old electronics. The longer the devices are stored, the less material value they have (and the less likely to be repurposed). This reflects the literature on obsolescence, where the social definitions of obsolescence, not necessarily the technological realities, determine when a device is obsolete.

5.4.4. Art of the Luddites

There was often minimal or no critique of planned obsolescence and consumerism. Sometimes obsolescence was connected with the tone of inevitability, that there are no alternatives, such as "a never-ending stream of obsolete equipment"[264] An article noted that: "Compounding the issue, environmentalists say, is the perpetual upgrade cycle as people seek out newer, more powerful computer models."[265] Sometimes during the holiday or Christmas season, articles did reflect more critically. A *Gizmodo* article demonstrates this by talking about the consumption connected to the holiday season and discussing planned obsolescence. Continuing the body imagery, upgrading and consumption of gadgets were discussed as a disease "upgraditis" or something out of one's control.

> Planned obsolescence and the industry's fast pace make it impossible to live by that creed. … A lot of the time we feel "forced" to upgrade we're really being driven by gadget lust, that powerful desire which makes us overlook the benefits of using old stuff.[266]

Very occasionally articles discussed the economic motivations or implications behind planned obsolescence–though they did not offer much of a critique of these issues. As an early *IDG* article noted that: "Over the next three years, 250 million computers are expected to become obsolete, according to the Environmental Protection Agency. That's good news for PC manufacturers but bad news for the environment."[267] The *Gizmodo* holiday article identified the pace of product releases and planned obsolescence, but not that these could be considered one and the same. The same holiday article in Gizmodo also reflected another pattern of when consumerism was criticized – using the word *luddite* as a slur or negative description: "I might roll with old stuff, but I'm not some sort of quasi-neo-luddite.

There was a small number of articles that covered e-waste art installations and projects. These art projects often sought to critique consumerism through the images of waste, in this case, critiquing device consumption through images of e-waste. As chapter four discussed, these articles did not convey the e-waste activist frames too often and had low scores on workers and environmental justice indexes. When artists had clear statements or were quoted in the articles, stronger critiques of consumerism were included. For example, *The New York Times* featured an e-waste photographer who worked with a non-profit cell phone recycler (Collective Good) to create expansive images of electronics. The article included extensive quotes by the photographer, whom *The New York Times* described as

> an openly passionate advocate -- or maybe a protester. While he is aiming for visually resolved images as an artist, the point is to heighten awareness about our collective environmental disregard. But art and advocacy can be at odds, the goals of one often canceling out the other. "My goal," he said, "is to try to face the complexity of the issue and honor it."[268]

But this was a rare article that explored the complexity of the art as well as giving a lot of space for the artist/activist to reflect about and discuss their project. Alternatively, in 2009, *Gizmodo* ran a short post entitled "The Tale of the Circuit Board Dragon," which featured a photo of an e-waste sculpture of a dragon. The entire article was two sentences and described the sculpture with this caption:

> Long ago, in a mystical land (China), there were heaps of electronics poisoning the Earth. A couple of those circuit boards were shaped into a dragon, and everyone lived happily ever after.[269]

This example reflects the differences in style and form between the digital and legacy media–the longer *The New York Times* article primarily focused on the artists as the main story, while the *Gizmodo* article was a re-post from another website with commentary by the *Gizmodo* writer. There is no context about the sculpture: it's unclear who made it and what their intentions for the piece were. But even in the brief article, the *Gizmodo* piece actually brings a critique of the sculpture and e-waste art projects generally–that making the e-waste into dragons or other shapes does not do much to fix the problem of the "electronics poisoning the earth." However, the article removes the responsibility of the consumption of the electronics from the U.S. and global North consumers, leaving the focus on the how the "heaps of electronics" in China are "poisoning the Earth."[270]

5.4.5 Responsibility, Blame and Injustice

As chapter four discussed, the topic of EPR was the most included topic for the

first three years of coverage and in 2004, 88% of articles included the topic. In 2005, *The New York Times* raised the following question:

> Everyone's becoming aware this is a problem, but the question is how to tackle it. Should the consumer shoulder the responsibility, the government or the manufacturer? Of course, it depends on who you ask."[271]

The New York Times is saying that depending on the stakeholder, answers will differ as to who should and how to fix the problems surrounding e-waste. But what's also being said is that whoever gets to say who is responsible for fixing the problem, is also able to assign blame for the problem.

Though not included in the possible group that might have answer to the problem, the e-waste activist network had fairly clear definitions of who and what was responsible for e-waste and the larger environmental justice problems of the CE/ICT infrastructure. The assigning of responsibility was embedded into the e-waste activist network's campaigning goals – extended *producer* responsibility, which as Raphael and Smith detail, had at least conceptually, been transformed to "extended product responsibility" by the late 1990s in the United States (2006, p. 250), but the more inclusive, equitable and structural approach, extended producer responsibility (EPR), was still the broader goal of the network. The environmental justice paradigm that the e-waste network drew from as their master frame, helped them as, I discussed in chapter two, "attract a broader range of participants and increased media attention" (Edge, 2011, pp. 256–257). But as this project has investigated, to what extent did the increased news coverage of electronic waste reflect environmental justice perspectives? And to what extent did the media coverage reflect sustainable capitalism perspectives?

As responsibility was being assigned, at least by the e-waste activists and

increasingly by the media attention, responsibility for e-waste, became a story about who to blame and what were the risks being responsible for e-waste problems. As *IDG* reported in early 2004: "But with vendor selection, as with the data security and environmental aspects of disposal, it all comes back to cost vs. risk."[272] Not surprisingly, given their background as an trade publication, *IDG* articles, emphasized that e-waste issues were about the *cost vs. risk* dynamic – what was right, or just and equitable, was not part of the discussion. For example, in early 2004, they ran two very similar articles which reflected the confirming article style, where they covered e-waste problems and the activist investigations after other media had: "Follow-up stories confirming the e-waste situation in Guiyu appeared in major U.S. newspapers."[273] Both articles were very long how-to guide in many respects. While most how-to articles where gear towards individuals, *IDG*'s "Disposing Of It Assets" focused on recommendations for corporate electronics disposal. The article begins reflecting the death/dying theme of coverage, with e-waste being depicted as a ghost: "How confident are you that your discarded end-of-life IT assets aren't going to come back to haunt you?" The subheads of the article offer insight into the industrial perspective on e-waste. The article gives advice on "data destruction, environmental liabilities, cradle-to-grave TCO (total cost of ownership), process automation, and vendors." [274] The other article "Toxic Legacy; Improper Disposal Of Obsolete It Equipment Is Fast Becoming A Major Liability For Corporations"[275] also The article emphasizes the distinction between costs and risks that companies use in calculating and managing their e-waste. The real concern is over embarrassment, not environment or health concerns, but rather the potential for corporate brands to turn up in unflattering photos of piles of e-waste"[276].

IDG continued their coverage of risks, noting in 2007 that “Somebody's going to get caught doing this and it's going to be big embarrassment”[277] while another article said: “It makes sense for companies to have a centralized recovery strategy so that one department doesn't get the entire organization in trouble with the law or the media.”[278] The problem for IDG is the laws and the media attention, the environmental issues are secondary. In some sense, the fear of being called a villain through the activist investigations did serve as motivator to improve practices, at least according to *IDG* recommendations. But the coverage about e-waste was to inform how to not get caught or improve practices.

Another pattern that connects with responsibility but deflects blame away from structural problems and towards individual problems or seemingly fixable ones, is corruption. Corruption was the problem with e-waste. It was the bad apples or the individual operators who exported illegally, “some scoundrels”[279] or “underground traders make Europe's waste disappear overseas.”[280] or as an e-waste activist said, "waste cowboys acting as e-scrap brokers."[281] The corruption theme actually did identify a slightly more structural issue with e-waste, that the general industry was shady, or “"has always been the used-car lot of the recycling world," Seth Heine laments.”[282] A New York Times article described, at length, how the process of recycling an air conditioner in New York City, was like a “drug deal,”[283] while the previously discussed, how-to (not be embarrassed by activists/e-waste information) article by IDG quoted an unnamed (by request) “IT executive at a large financial services company” saying “"You can still get a guy in a little red truck to haul away your PCs.”[284]

Despite one of the key NGOs of the e-waste activist network having a name about

the Basel Convention, (BAN), the Basel Ban and the context and history about the Treaty was not seen too often in coverage. This absence meant that assigning responsibility to the United States how its failure to ratify the treaty impacted the growth of the informal sector of e-waste was also not addressed in coverage. Longer articles were able to give more context about the impacts of the Basel Ban, such as when the *Associated Press* described the Basel Convention as "an international agreement that outlaws the trade [of e-waste exports]" and further clarified that:

> though U.S. states increasingly require that electronics be sent to collection and recycling centers, even from those centers, American firms can send the e-waste abroad legally because Congress hasn't ratified the Basel Convention.
>
> The results are visible on the streets of Guiyu, where the e-waste industry employs an estimated 150,000 people.[285]

However, articles could also bring more perspective to the issue and still fail to connect the problems to the Basel Treaty. For example, a long *CNET* article explored tensions between consumption and obsolescence and discussed regulations from government and industry perspectives. The final third of the article includes specifics about EPR but the article does not clarify what EPR is and the reporter just leaves the activist's quote stand on its own:

> Ted Smith, chairman of the Electronics Take-Back Coalition, called on Congress not only to require such "producer responsibility" but to prohibit exporting toxic electronic waste to poor countries for disposal, which is clearly something that states don't have authority to do.[286]

Furthermore, the article does not discuss the Basel Treaty and fails to examine why states (or US EPA) can't restrict toxic flows.

Guilt and environmentalism were connected and focused attention on how

individual responsibility and consumer behaviors contributed to environmental problems but there was little connection to how to support policy initiatives or structural changes. For example, a USA Today article, "Green With Just A Touch Of Blush; The Environmentally Conscious Feel Guilty When They Slip Up"[287] included a statements from a journalist from environmental news outlet, *Grist*, who did try to contextual the problems of focusing on individual behavioral changes without structural change, but these quotes were at the very end of the article and they focused on purchasing large items like cars and appliances as how individuals could make a difference, not small, daily decisions (i.e. paper or plastic). Consumer ignorance was also the problem, because "consumers were …unaware of the recycling programs -- and of the potential hazards of throwing out their phones."[288] Assigning blame to consumers rather than the high profit margins that CE/ICT companies require, for example, was also a pattern. For example, "Still, no one is quite ready to take on the task of managing the high-tech refuse that U.S. consumers are jettisoning with abandon."[289] While another article quoted a congressperson saying the "problem" was that:

> "Consumers need to stop, well, consuming, as much… Here we are today talking about a problem that's almost totally self-inflicted," he said, adding: "People need to work; why can't they work rebuilding this equipment or repairing it rather than just throwing it away?"[290]

While still focusing on individuals as the problem for e-waste, the quote does connect to the issues of repair and reuse.

Occasionally, articles gave more space to challenging the industry perspectives on responsibility; industry did not have total consensus especially in the early period (Raphael & Smith, 2006), but generally agreed in principle with each other, especially in

terms of not wanting to lose profits or market share. For example, in a *Wired* article, an activist from Californians Against Waste (CAW) was able to push back a bit on the concept of *shared responsibility*, a message strategy that took the EPR concept and flipped it back onto the consumers and citizens:

> "The notion that the bill would make manufacturers solely responsible concerns us," said David Isaacs, director of Hewlett Packard's global public policy. "We believe in shared responsibility, a responsibility of the consumer, government, retailers and other parties."
>
> Isaacs said HP is willing to haul truckload quantities of e-waste from a collection point, but establishing collection points in communities should be the responsibility of others. CAW's Murray, on the other hand, said computer makers put toxins in their machines and they should take full responsibility for their disposal.
>
> "Sharing is a really nice concept, but the fact is that HP makes decisions about how to design their product -- to put toxic materials into the product," Murray said. "Nobody else has that power." [25020]

Through the activist's quote, the article raises the issue of product design choices that consumers have no control over; the concept of power is actually included – that what shared responsibility masked is inequitable power distributions, which are also reflected in the broader environmental justice issues surrounding CE/ICTs and e-waste. When structural problems were raised, they could be talked about as *root problem*, such as when an activist from the ETBC was quoted saying: "recycling does not eliminate the root problem: the vast amount of electronics generated in the first place and fated for disposal."[291] But generally, coverage had minimal discussion of structural problems and attribution of responsibility and blame beyond blaming individual recyclers or consumers.

This chapter has presented the major themes that occurred in the 12 years of e-waste coverage and explored how the coverage reflected patterns related to

environmental justice and sustainable capitalism. Through looking at activism, labor, the growth of the e-waste sector and consumerism I examined portrayals of activism, digital inequalities, e-waste policies, the dynamic between representing formal and informal disassembly sites and labor which contributed to overall absences and erasures of people, different social understandings of repair as well as reproduced problematic representations of marginalized people from developing countries. I also examined how the attention to the profit making potentials of commodity reclamation through e-waste had potential to draw attention to neocolonial patterns of extraction, coverage reinforced and publicized the growing, mostly private, infrastructure of e-waste recycling and disposal, and promoted the sustainable transition of CE/ICT through attention to new *green* products and individualized benefits of CE/ICT products through reduced energy consumption.

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[1] (Skillings, 2002)
[2] (Weise, 2009)
[3] (Grossman, 2005)
[4] (Fried, 2003)
[5] (Castro, 2003)
[6] (Wong, 2006)
[7] (Koch, 2010)
[8] (Blair, 2009)
[9] (Franklin, 2008)
[10] (Hart, 2008b)
[11] (Lombardi, 2009)
[12] (Diaz, 2008)
[13] (LaMonica, 2010a)
[14] (Belkin, 2008)
[15] (Deutsche, 2007)
[16] (Jacob, 2009)
[17] (Jacob, 2009)
[18] (Kessler, 2007)
[19] (Belkin, 2008)
[20] (Stark, 2003)
[21] (Tugend, 2005)

[22] (Kornblum, 2007)
[23] (Navarro, 2009)
[24] (Grossman, 2005)
[25] (Schmit, 2008)
[26] (Chow, 2008a)
[27] (CBS Interactive Staff, 2008)
[28] (K. Dean, 2003)
[29] (Nosowitz, 2009)
[30] (Markoff, 2002)
[31] (Hines, 2004b)
[32] (Mitchell, 2004)
[33] (Erlanger, 2007)
[34] (Horn, 2010)
[35] (Smykil, 2006)
[36] (Smykil, 2006)
[37] (Smykil, 2006)
[38] (Jade, 2006)
[39] (Chow, 2008b)
[40] (Mahoney, 2008)
[41] (Sterling, 2007)
[42] (O'Brien, 2007)
[43] (Lam, 2007)
[44] (Max, 2007)
[45] (Buchanan, 2007)
[46] (Skillings, 2002b)
[47] (Skillings, 2002b)
[48] (Skillings, 2002b)
[49] (LaMonica, 2010b)
[50] (Wenzel, 2005)
[51] (Lakshmi, 2010)
[52] (Sylvers, 2009)
[53] (Pratt, 2007)
[54] (Musgrove, 2003)
[55] (Konrad, 2005)
[56] (Lombardi, 2011)
[57] (LaMonica, 2010a)
[58] (LaMonica, 2010a)
[59] (LaMonica, 2010a)
[60] (Eilperin, 2005)
[61] (Kaufman, 2009)
[62] (LaMonica, 2011)
[63] (LaMonica, 2010a)
[64] (Eilperin, 2005)
[65] (Fried, 2003)
[66] (Wenzel, 2005)

[67] (Kessler, 2007)
[68] (Spooner, 2004b)
[69] (Broache, 2008)
[70] (LaMonica, 2011)
[71] (Hart, 2008b)
[72] (Skillings, 2002b)
[73] (Drucker, 2004)
[74] ("Dell spent $800,000 lobbying federal government in first half of 2007," 2007)
[75] ("Consumer electronics group spent $1.5 million in 2007 to lobby on internet, trade issues," 2008)
[76] ("Samsung information systems America spent $320,000 in 2007 to lobby on digital television," 2008)
[77] ("Samsung information systems America spent $320,000 in 2007 to lobby on digital television," 2008)
[78] (Hart, 2008b)
[79] (Hart, 2008b)
[80] (Liedtke, 2008)
[81] (Ogg, 2008a)
[82] (Liedtke, 2008)
[83] ("US watch: Minnesota: Best Buy to test program to accept electronic waste," 2008)
[84] (Buchanan, 2008)
[85] (Hruska, 2008)
[86] (Wenzel, 2008a)
[87] (Yamamoto, 2008)
[88] (Pitman, 2008)
[89] (Pratt, 2008)
[90] (Pratt, 2008)
[91] (LeCompte, 2008)
[92] (Ogg, 2008b)
[93] (Chen, 2008a)
[94] (Chen, 2008a)
[95] (Wilson, 2008b)
[96] (Frucci, 2009)
[97] (Frucci, 2009)
[98] (Blair, 2009)
[99] (Palm, 2009)
[100] (Rosenwald, 2009)
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[103] (Blair, 2009)
[104] (Coleman, 2007)
[105] (Mooallem, 2008)
[106] (Meyerson, 2003)
[107] (Moore, 2006)
[108] (Jacob, 2009)

[109] (Grossman, 2005)
[110] (Musgrove, 2003)
[111] (Nunnis, 2013)
[112] (Eilperin, 2005)
[113] (Weise, 2009)
[114] (Bowman, 2003)
[115] (Konrad, 2003)
[116] (Koenig, 2003)
[117] (Flynn, 2003)
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CHAPTER VI

CONCLUSIONS

This chapter assesses the links between the findings and provides an integrated interpretation of the research questions and analysis. The chapter concludes with a discussion of limitations, contributions, and future research.

The driving questions for this project were: How does the media story of electronic waste change over time? To what extent did legacy and digital media news coverage of electronic waste reflect environmental justice or sustainable capitalism perspectives? This research project is not just a study of news coverage, as it is not just an assessment of environmental activism. As the discussion about the social context of obsolescence, repair and reuse examined, the social and environmental issues of e-waste are not just piles of toxic computers, but reflect and refract complexities of neo-colonialism, creativity, greed, good intentions, privilege, and consumption.

6.1. Overview of Results

E-waste is an environmental justice problem that reveals the exploitative infrastructures of CE/ITCs. Activists had "significant control over how e-waste [was] framed because [they were] primarily responsible for creating awareness of e-waste amongst the public." (Edge, 2011). Media coverage of e-waste is used by scholars and activists as evidence of successes and changes in public awareness, but no research has looked at what happened in the media coverage. Furthermore, popular sources of technology news are understudied.

What begins as an environmental justice problem becomes a green opportunity. Generally, the legacy media covered the e-waste sector, policy, harmful materials, growing e-waste, toxic, OECD/non OECD locations of responsibility/impacts, justice and global workers more than the digital media, whereas the digital media covered consumerism, product design, supply chains, obsolescence, and Anthropocene to a small extent (but still in higher percentages than legacy). Through the EJ Themes and Workers indexes, I showed how digital media covered both Workers and EJ Themes less than the legacy outlets, but that all media coverage failed to cover these topics in a substantive way. For example, the mean score for the Workers index was .95 (legacy) and .65 (digital) out of possible score of 6, while the EJ Themes index means scores were 2.42 (legacy) and 1.89 (digital) out of a possible score of 9. So while there was coverage of environmental justice issues, the coverage was fairly thin over the 12 years. The inclusion (or really exclusion) of disassemblers as sources has been discussed at various points in this dissertation. This absence was really profound during the interpretative analysis, where issues of erasure and dated binaries of primitive/technical labor sites was used in coverage, and as I'll discuss shortly, contributed to the limited and narrow definitions of repair, reuse, and employment.

6.2. Public Awareness Of Media Infrastructures

In chapter two, I discussed Parks & Straosielski's (2015) question about how to raise public awareness of media infrastructures. This project has explored how media coverage dealt with the exploitative circuit that constitutes CE/ICT production, consumption and disposal infrastructures. In order to investigate the environmental and

social justice issues of CE/ICT disassembly we must look to the technology industry and news about technology. My study starts from the place of where information about ecological problems with CE/ICTs begins for many people–with the media and news coverage of e-waste. Watson (2016) argues that there needs to be "critical technology coverage" (p. 25). What does *critical technology coverage* contribute to critical political economy of communications? How might critical political economy of communications engage with critical technology news coverage? My research offers a step towards this discussion by contributing a historiography of the trajectory *critical technology coverage* through studying the digital news media during the early 21st century and exploring how these evolving (and rarely studied) outlets responded to and covered environmental justice issues surrounding e-waste.

6.3. Decolonizing E-Waste Coverage

One of the more important contributions of this research is to confirm what people seem to have observed about portrayals of non-western/global south people in e-waste coverage. The indexes and the content analysis provide empirical data about post-colonial representations in e-waste coverage, reflecting trends of "hyperbolic" coverage (Burrell, 2016). While not explicitly a content analysis of post-colonial representations, through embedding critiques and attention to "location, voice, and agency" (Shome & Hegde, 2002, p. 266), the study investigated the power/role/presence and absence of sources and topics within the coverage of e-waste labor. The document analysis explored these patterns in more depth by identifying the articles that did cover labor issues. However, even though articles sometimes included issues of labor there was still a

neocolonial pattern which reinforced lack of agency and the passivity of poor people as victims.

Linking post-colonial analysis with political economy of communications is also a contribution, especially in the examination of electronics repair and reuse. It is interesting to note the disparate discourses that surround the various communities of formal and informal electronics disassemblers, refurbishers and recyclers. Hackers and global north *makers*, for example, are portrayed as the cutting edge, super thrifty, geek chic (Tanenbaum, Williams, Desjardins, & Tanenbaum, 2013); while informal electronic recyclers are often voiceless seen through images or numbers reporting their toxic levels, but with little accounting of their agency and creativity in their recycling endeavors (Fonseca, 2015). Since this research period ended 2013, the issues of repairability have had more attention in the media (Koebler, 2106) and within critical scholarship (Jackson, 2014).

There are many challenges to finding equitable and participatory ways to craft social definitions and policies of reuse, repair and obsolescence. Increasingly these conflicts over repair and reuse definitions are playing out through coverage of e-waste: as some activists and institutions begin to complicate their portrayals of informal e-waste sites, others continue to maintain more narrower definitions of repair and reuse. These dynamics also reflect the absence of non-western/informal sector actors in media coverage–as you must be included in the story to share your definition of the concept.

By the end of the news cycle, activism about repairability, copyright and planned obsolescence starts to develop in the United States. In 2012, *Wired* runs an opinion article about OEMs using legal threats against people trying to publish and share repair manuals

for electronics. The author and founder of iFixIt says, “If market forces are unable to persuade Toshiba to reverse course, we may need to force them to” (Wiens, 2012). As discussed in chapter five there is now policy activism around copyright laws related to repair and access to manuals and more recently, cross-border (and illegal according to the OEMs) digital sharing of repair manuals for larger appliances like farm tractors (Doctorow, 2017). Additionally, there are also conflicts over the reselling of refurbished devices, such as the Indian government challenging Amazon over imports of refurbished phones (Bhattacharya, 2016).

Development communications research has long investigated a range social and political impacts of and on ICTs. Post-development and post-colonial scholarship has also explored how discourses surrounding technology have reflected powerful social and political forces. The issues surrounding the ecological consequences of CE/ICT life cycles cannot be separated from complex dynamics of digital and social inequities. Digital inequalities in terms of access, knowledge, and participation are fundamentally connected to the political economic forces that influence the production, distribution and disposal of CE/ICTs.

There needs to be more attention to the resilience and creativity involved with repair and reuse, while also maintaining critical attention to the exploitative infrastructure and inequitable share of toxic burdens on developing regions. This project contributes some analytical tools that can help political economists interested in the overlaps between copyright law/intellectual property and the environmental impacts of consumer electronics through the examination of how to study these conflicts through media coverage.

As I discussed in chapter two, there is a need for more connection between social movement studies, post-colonial criticism and critical political economy of communications (and subsequently, ecological materialist media studies). Maxwell and Miller (2012) have argued that structural changes to the unjust and exploitative systems of labor surrounding CE/ICT are:

> contingent on the success of activists, researchers, policy makers, and unionists seeking greater transparency in working conditions through the ICT/CE supply chain. For consumers, this transparency can fuel their understanding of electronics worker' experiences China, India, Mexico, and elsewhere – knowledge necessary for cultivating empathy with workers who disappear in the twilight zone of the technological sublime. (p. 108)

This project has examined twelve years of some of these moments of more transparency that Maxwell and Miller call for; moments which were largely initiated by e-waste activists' work at raising awareness through the media. The findings from this study raise some questions regarding the assumption behind Maxwell and Miller's call: that more transparency will lead to more empathy in consumers which (may) lead to more equitable and just labor conditions in CE/ICT industries. If the transparency of the working conditions largely relies upon colonial frames, we must question the tendency of images and narratives to *cultivate empathy* which might inspire and empower consumers to work towards social justice as opposed to narratives that reinforce longstanding colonial dynamics of privilege, whiteness and power.

The victimized and passive portrayals of disassemblers and residents who live near informal electronics disassembly sites must be challenged. In some respects this might be an unintended consequence of the e-waste activist network's reliance on the moral drama framing strategy, as that plays too much in favor of (a) actors seeking to turn

the page of the story so they can stop being the villain, through a variety of reputation management strategies and (b) over-simplification of complex situations which leads to a relying on old, oppressive, colonial portrayals.

6.4. Challenging the Circuit of Exploitation

While critical communications scholarship often calls attention to injustice, more attention is needed into how the public and social movements are challenging the exploitation embedded into infrastructures of CE/ICTs. This dissertation has explored some of these activities through looking at how news about e-waste discussed environmental activism.

How did media coverage of e-waste portray environmental activism? As chapter five discusses, environmental activists and activism during the 12 years of coverage were portrayed within a dynamic of angry, silly activists but also as researchers and experts. Much of the labor of activism was hidden in coverage; for example, industry actors would be given credit for self-improving in terms of corporate policies around e-waste, yet the policies and the pressure to get the industry actors to participate were conducted by activists. Generally, as other scholarship on social movements has found, environmental activism during e-waste coverage lacked context and history. Some media outlets, especially digital media during the early and middle parts of the issue cycle, were uninformed about activist campaigns and practices. This, among other reasons, likely contributed to some of the hostile coverage that activists received.

While there were some notable exceptions over the 12 years of coverage, generally environmental activists were not included in coverage of e-waste issues with

the same degree of respect and authority given to other sources, particularly industry and market analysts/experts. Activists did have success in generating media attention with their research investigations, and when they were used as expert sources, coverage tended to include more topics related to environmental justice. This, along with the general practice of the e-waste activist network's use of investigative reporting tactics, supports Fenton's (2010) insights about NGO actors becoming *pseudo journalists.* I would argue for a less derogatory term to classify this phenomenon, something closer to *hybrid-journalists* or *civil society press*. Research about human rights documentarians (e.g., Witness, Human Rights Watch) and press/aid worker dynamics might be useful to expand upon this.

Coverage of activism had a noticeable spike in the percent of articles including the activism topic between 2004-2005; this was a little surprising as the e-waste activist network had been engaged in the Dell campaign since 2001 and the *Exporting the Harm* report was released in 2002. The spike in coverage of activism during that period was mostly reflected in the digital media, which in 2004 more than doubled the percent of digital articles including the activism topic. After this year, digital media inclusion of the topic had steep decline and had increasingly lower amounts of articles including activism, until 2013, when no digital articles included the activism or the activist report topics. Legacy media was slightly less erratic but did have a similar, though smaller, spike in coverage of activism during 2011, partially because no legacy article included activism in 2010. Legacy media's inclusion at the end of the coverage period was close to one the highest years of coverage (in terms of percent of legacy articles including the activism topic), yet from 2010 to 2013, no activist reports were discussed in the legacy media.

Generally, if just getting quoted matters, than environmental activists were consistently included as sources, but these inclusions decreased over time, especially as experts and e-waste sector sources increasingly were used in both types of media. Another observation is that there was limited diversity in terms of activist spokespersons who were sourced in articles throughout the 12 years of coverage. Further research might determine the depth of activist sourcing choices that media coverage included. Depth of coverage would mean the range of voices and participants who are used as spokespeople. While my findings do support the research of Fenton and NGOs as pseudo-journalists, the findings also complicate Fenton's work because in some respects, the NGOs involved in the e-waste activist network were able to get some of their strategic messages out–at least in the early period (2002-2004) but the depth of these messages such as EPR weakened over time. As the next section discusses, my research also expands work that looks at how neoliberal discourse operates within media coverage of environmental issues (Schneider, Schwarze, Bsumek, & Peeples, 2016).

6.5. News, Justice and Neoliberal Hegemony

In both the content analysis and the document analysis, I operationalized environmental justice connected to e-waste activist descriptions and the environmental justice movement's definitions: issues of equity, institutional racism and classism in environmental policy decisions, and more generally the tone of justice or injustice (see Appendix C, Principles of Environmental Justice document). The environmental justice perspective was present at points throughout coverage; however, the degree to which it was present varied. Both the document analysis and the content analysis demonstrated

that environmental justice perspectives were not in a significant amount of coverage. This is not to say that environmental justice topics and activists' frames did not gain attention, but the overall trajectory of the attention declined fairly substantively after 2004, even with the attention to the *Digital Dump* report after 2005, Greenpeace's *Green My Apple* campaign and the *Greener Electronics* reports (published through 2012). As discussed in chapter four, the indicators of EJ Themes in coverage differed between media types (legacy included more articles with more in-depth coverage of EJ Themes) and coverage decreased over time, though there was a slight uptick at the very end with more coverage by the legacy media.

Separately the topics that made up the EJ Themes index also reflected these patterns, most clearly, EPR. The topic of EPR was in 88% of all articles in 2004 but was only in slightly more than 5% of articles in 2012. The inverse of this trend was the consumption and product design topics. As EPR went down in mentions over time, consumption continued to be in more articles. Product design and obsolescence reflected a similar upward trajectory, but not as sharp a difference as consumption and EPR. Combined with the abysmal scores on the workers and EJ Themes indexes, the attention to environmental justice perspectives was marginal.

Another area that this project contributes towards is questioning the impacts of e-waste art projects as a media strategy–not that art is only for a media story–but when e-waste art projects were covered, the environmental justice perspective was minimized. Not surprisingly, longer articles on artists and art projects offer more space for deeper coverage of environmental justice. Given the trends of shorter articles with less sources and space for context, if activists want to use e-waste as art for advocacy, the publicity

strategy needs to prioritize the environmental justice components of the project for the journalists and writers who might cover the project.

While a goal of the e-waste activist network was to increase EPR, how responsibility was dealt with in the coverage was more complicated than just assigning responsibility to OEMs and industry. Responsibility and blame shifting for the range of problems surrounding e-waste became one of the shells in the framing shell game. As discussed in chapter five, responsibility and risk were also connected; brands were concerned about risks to their reputation, less about their actual environmental injustice. When responsibility was assigned *it was primarily individual solutions or culprits with names rather than structural or root problem naming*: An e-waste reseller was corrupt, or a local community could improve the numbers of phones not thrown into the trash. But broader issues of mass consumption, inequality, working conditions, power, or transparency issues of the CE/ICT industries remained mostly unquestioned. Gitlin (1980) observed that "the news routines are skewed toward representing demands, individuals, and frames which do not fundamentally contradict *the dominant hegemonic principles*" (italics original, p. 271) of neoliberal capitalism. Almost forty years later, this "fundamental and inescapable dilemma" (p. 290) of social justice movements is reflected through the media story of e-waste.

The e-waste story had lots of potential to show the tech industry in a negative light. The evolution of the story reflects the constant push back on critique and structural analysis–for if the implications of e-waste were to be really understood, then an entire critique and questioning of capitalism's need to waste would need to be discussed. When the costs (fiscal, risks, environmental, branding) were mentioned, stories would not

include human labor involved in dismantling or exporting. The technical optimism and focus on high-tech solutions hide the low-tech sector and informal labor. E-waste pollution and environmental hazards were also discussed separately from disassembly. If toxic flows (from North or wealthier countries to South or poorer countries) were included in coverage, the historical context and/or potential impacts of the Basel Ban were not included. Responsibility occasionally was attributed to broader issues of mass consumption, but these attributions tended to focus on the type of consumption as the problem and thus claim that managing the problem of consumer education and individual corporate practices is the solution which does not address the larger systemic problems.

References to structural problems were rare in coverage of e-waste; there was an easier party to blame than structural inequalities related to transnational capitalist globalization: the individual consumers. Generally, it was these same consumers that could also solve the problems of e-waste, through consuming *greener* electronics. The e-waste activist network's emphasis on the cultural consonance of frames, in some respects, facilitated the industrial cooptation of the messages into ones about consuming better and how to make money off of one's initial consumption. Some of the issues related to design and toxics did seem to get more traction, but the lack of attention to obsolescence and the over-production/consumption requirements of transnational neoliberal capitalism allowed the reframing of product design and green product/green tech to get more media attention than reuse and refurbishing topics which discussions of obsolescence could expand. Sustainable capitalism perspectives were found throughout coverage and seemed to have been supported by the *culturally consonant* goals of better design and responsible recycling, which became public relations opportunities to combat the negative press

accounts of environmental and health hazards.

In regards to myth and rhetoric of technology within neoliberal communicative capitalism, this study found that mostly the patterns fit what scholarship has said about how technology is covered in media. This theme overlaps with consumerism and the environment/justice because much of how technology is discussed connects to its role as a fetish object for consumption.

Why e-waste continued to grow was rarely connected to over-production and consumption but rather to a construction that it's too expensive to properly deal with waste. The cost of waste becomes the explanation for why the dumping in developing areas happens–because there are fewer regulations and it is cheaper. So in this way regulations were blamed for e-waste problems, either as too stringent in the U.S., which causes the growth of the sector and increases costs for OEMs, or the regulations were too lax in countries with extensive informal sectors. As Ong notes, neoliberalism is not just a set of practices and discourse, but is "a relationship between government and knowledge through which governing activities are recast as nonpolitical and non ideological problems that need technical solutions" (Ong, 2006, p. 3). The growth of the private e-waste sector and the narrative told about the growth reflected this process.

The e-waste activist network did have some successes in getting their messages spread through early media coverage – especially about EPR, harmful materials in electronics and that e-waste is toxic waste. This same time period was also when the network achieved notable policy victories in terms of state laws and individual corporate practices. For example, when coverage of e-waste began, no state had an electronics recycling law; almost fifteen years later, 25 states have some sort of e-waste law (NCER,

2017). These successes, given the hegemonic obstacles of transnational corporate power and neoliberal capitalism, point to the importance of early framing of this issue.

However, the e-waste activist network's acceptance of the *conceptual tariff* of neoliberal priorities and political processes became a somewhat self-fulfilling prophecy– not stressing more critical solutions and perspectives while emphasizing the moral drama and the heroes and villains framing approach, facilitated the shift of messages to the greening of the industry and growth of the e-waste sector without dealing with the structural issues and environmental justice concerns.

E-waste activists' assessments of their media campaign strategies clearly identify that shifts in media coverage of e-waste occurred after the release of *Exporting the Harm* video and report. Their early communication strategies focused on dramatic images of computers in garbage dumps. According to e-waste activists, the pictures of trashed computers,

> dramatizing the problem of producers' commitment to rapid obsolescence and the government's inability to handle the resulting surge of waste. But these images could not represent the sharp sting of injustice perpetrated by one entity against another. (Raphael & Smith, 2006, p. 254)

The shift in media strategy that the activists employed in the *Exporting the Harm* reports "captured wide media attention in part because it added human figures to the stage" (Raphael & Smith, 2006, p. 254). The media attention to *Exporting the Harm* continues to be a source of evidence of activist success. Edge's (2011) interviews with activists noted that "increased public awareness of e-waste was cited by one member of the network as one the e-waste network's most important successes" (p. 165).

As a new cycle of attention to e-waste problems begins, the importance of the attention to *Exporting the Harm* reports and the shift in strategy that included *human*

figures, continues to anchor the network's narrative of media success. BAN released a new investigation in 2016 which provided a timeline of e-waste activism, noting that

> *Exporting Harm* placed a spotlight on a new form of corporate and personal irresponsibility. Suddenly everyone involved in manufacturing, consuming, or disposing of an electronic device became suddenly aware of their role in a grand scheme of globalized environmental injustice. (BAN, 2016, p. 85)

One of the areas that this dissertation has investigated is the discourses and narratives that surround the circuits of exploitation of CE/ICTs and neoliberalism. Twelve years of media coverage was used to investigate the stories and perspectives that were elevated or not in order to assess how the story reflected perspectives that supported environmental justice or sustainable capitalism. Through this research I have highlighted the invisibility of labor in media coverage of e-waste. We must ask, why was labor invisible, especially if including human figures (who are doing the labor) seems to have been a successful way to attract media attention. Why was the environmental justice perspective not comprehensively included in coverage of an issue that so clearly reflects environmental justice concerns?

As this dissertation has also explored, the same period of e-waste activism, policy struggles and media attention was also a critical historical moment for news and CE/ICT industries–both areas that are implicated in the story of e-waste. Given the tectonic shifts in the media industries happening concurrently to the e-waste campaigns, it seems as though an unintended consequence of the e-waste activist network's success in gaining media attention, was that the images and stories of injustice became the product for the news media to profit from in terms of gaining audience attention. This trend was also combined with the industry's self-interest in refocusing attention away from injustice

embedded in the CE/ICT infrastructure and towards sustainable consumption and the myth that we can purchase social justice through products (supported through certifications, green marketing/greenwashing).

Therefore, the title of this dissertation, *Consuming Justice*, reflects how dynamics of consumption and justice are intertwined in neoliberal capitalism and that the media that activists rely upon to spread their message are also culpable in the circuit of exploitation of CE/ICT that e-waste issues highlight. Media (digital and legacy institutions) of course rely upon the hardware and CE/ICT infrastructure to produce and distribute media but also in their reliance on CE/ICT advertising. Media workers are not unaware of these dynamics. Former *Gizmodo* editor, Brian Lam noted that:

> Consumer electronics tech journalism is very tricky. Those who strictly cover commercial CE depend on a powerful handful of companies for the very lifeblood of their content. That's a dangerous position…. And every gadget journalist has wrestled with his conscience as he gains more access and becomes inseparable from the industry and depends on more and more of these scoops. (Lam, 2008)

Additionally, former *CNET* senior editor, Jim Kertstetter, noted in a *CNET* article which discussed their decision to run three lengthy features on the production and disposal of iPhones that:

> Just as "Harvest of Shame" wasn't about getting people to stop eating, we're not trying to convince you that buying that iPhone (or that Samsung Galaxy S III, HTC One X, or Motorola Droid Razr M) is a bad idea or that you should buy something else.
>
> We simply wrote the series to *shine a spotlight* on the costs -- environmental and human -- of making a device millions the world over crave. (Kertstetter, 2012)

Both of these former editors at digital new outlets now work for *The New York Times*. Jim Kertstetter is a deputy technology editor. Brian Lam is the founder and advisor for The

Wirecutter, which *The New York Times* purchased for approximately $30 million in 2016. The acquisition was described by *The New York Times*:

> As the New York Times Company transforms for the digital age, it has moved more into lifestyle journalism…Now, it has made another bet on so-called *service journalism*, with the acquisition of the product recommendation site The Wirecutter. (Ember, 2016)

More research is needed on these emerging categories of journalism, like service journalism that The Wirecutter reflects. But what these examples show is why there is a need to continue to pay attention to naturalizing spaces of CE/ICT, the relationships between advertising, public relations and technology news coverage and role of the transnational capitalist class who help shape media coverage and the implicit priorities of the culture-ideology of consumerism.

The implications of these dynamics reflect through the coverage of e-waste. The economic model of journalism under neoliberal capitalism has generally maintained a parasitic relationship between advertisers and journalism–the news outlets need to provide audiences to the advertisers in order to maintain income and profitability. One of the ways to attract audiences is to draw attention through visceral images, dramatic stories and scenes–all strategies which are reflective of the hyperbolic coverage of e-waste. Audiences were consuming the stories and images of e-waste injustice within this dynamic that has every interest in maintaining the status quo and not, for example, fundamentally challenging the culture-ideology of consumerism.

6.6. Limitations

Interdisciplinary approaches can always be strengthened by additional lens and research, yet one can only include so many perspectives at a time. Some additional areas

that were not included in this project but could be included in the future are: work on media geology and new materialism (Coole & Frost, 2010; Cotter, 2016; Parikka, 2015), research on the dynamics between media and global labor movements (Evans, 2010; Maxwell, 2016) and scholarship that links social movement studies and science and technology studies (Breyman, Campbell, Eubanks, & Kinchy, 2017).

There are some technical limitations to this study that I believe could be resolved with future research. One was that I manually conducted the searches for articles that were not available in the academic databases. Due to the restrictions of the search and the manual collection of articles, I may have missed articles due to search engine limitations. Additionally, I would expand the search terms to more fully reflect the issue as it has developed over time. For example, I did not search for *e-scrap* nor did I search *phone recycling*. The quantitative study was limited to text and future analysis should include multi-media elements as part of the content analysis. I also think there should be a more explicit focus on public relations materials from CE/ICT companies.

As the research was exploratory, the limitations of the project also relate to scope. The project was very broad in assessment and further research would investigate more deeply a few of the concepts rather than the landscape view of the historical period that I have provided. Finally, I think the strongest projects studying activism are ones that include activists and other stakeholders in the research process. While this is a limitation of the project, I think that my approach of building the coding categories and document analysis through activists' writings and evaluations of their campaigns and media strategies contributed to a more robust study.

6.7. Contributions and Future Justice

The period which this dissertation explores reflects enormous shifts in environmental awareness and sustainability, news and information distribution, digital journalism and the rising significance of the CE/ICT industries. One of the contributions that this project makes is an effort to link ecological materialist media studies, critical political economy of communications and technology more closely with environmental justice and social movement studies. I've also identified an area of media/journalism that is understudied but contributes to popular understanding of technologies, science and environmental policies.

While scholarship calls for more mixed methods approaches to studying media content, the task of conducting an in-depth and longitudinal study is challenging, especially as a solo researcher. A methodological contribution that this project makes is to engage with these challenges and produce research about media coverage of social and environmental justice that contributes both quantitative and qualitative analysis. Furthermore, the topic indexes quantitatively showed that the criteria of workers issues and environmental justice themes hung together and are meaningful; the indexes and the codebook could serve other researchers in the field.

This project has taken cues from Ekecrantz's call for critical communications researchers to include a "stronger focus on global inequalities and social transformation" (Ekecrantz, 2011, p. 487). I believe that my project also contributes towards that goal both in its focus on global problems and transnational environmental activism and by grounding the project within development communication for social justice.

Given the exploratory nature of this research project, there are a range of directions

which future research could explore. More work is needed on the examining the narratives that we use to struggle against the circuit of exploitation of CE/ICT infrastructures. I am also interested in the role of public relations and reputation management in these issues and would like to build upon critical media infrastructure study's investigations into the *naturalizing locations* of CE/ICT, like Acland's (2015) work on CES. In the short term, I plan to use computer textual analysis on the data set that I have in order to further examine the content for patterns that I could not observe. Additionally, following Watson's (2016) arguments for a new phase of technology news coverage in the post-Snowden era, I would like examine how technology coverage and digital news outlets have addressed other social justice issues that connect with the infrastructure of CE/ICT, such as immigration, global trade policy struggles and privacy/civil liberties.

I believe there is need for further study of the role of popular education within repairability, reuse and social justice hardware/technology projects. I would like to explore how various communities and activists are defining what environmental justice hardware and CE/ICT products could look like. We, in many respects, know what unjust, unsustainable and exploitative CE/ICT products are: they are the products and industries that exist currently. There continues to be excellent research that illuminates the struggles and work of supply chain activism and labor organizing in CE/ICT production, such as Brophy and de Peuter's (2014) proposal for "commodity unionism" (p. 76) as well as Richard Maxwell's (2016) outstanding edited collection focused on labor and media.

Jonathan Sterne has asked what would "democratic hardware" look like? (Sterne, 2007, p. 29). There are projects that are working to answer this question, like the Open

Source Hardware Association (Open Source Hardware Association, 2016), the Fairphone project (Cahalane, 2016; Pesce, 2016) and the Good Electronics Network (Overeem & Anning, 2016). There is also benefit is examining failed projects like PhoneBloks and Project Ara (Jones, 2017; Love, 2016; Warren, 2016; Weber, 2017). My research has highlighted the need to explore a multiplicity of ways to discuss repair, reuse and obsolescence while also elevating environmental justice concerns–like self-determination and of rights to work in toxic-free environments. Repair and reuse issues are currently gaining attention in the U.S. press and I think there is space for an analysis of this current shift of social activism around technology, the environment and justice.

Supporting autonomy and having local influence in determining solutions to environmental problems and policy are key tenants of environmental justice. This is not to say that attention should not also be on the broader infrastructure of injustice of CE/ICT. Toxic, dangerous and expanding to new locations globally, e-waste labor and pollution issues are still pressing and there seems to be the beginnings of another cycle of media attention (EarthFixMedia, 2016; Grossman, 2016; Koebler, 2017; Matchar, 2016; Minter, 2016; Turner, 2016). It remains to be seen if the past patterns of media coverage of e-waste will continue in the latest cycle of media attention.

What is clear from this research project is that the reliance of the moral framing and the heroes and laggards approach to telling the story of e-waste does not necessary expand media coverage that reflects environmental justice. Given the neo-colonial dynamics of e-waste and the broader exploitative infrastructures of CE/ICT as well as the intersectional legacies of institutional racism and class privilege of the mainstream and reformist global north environmental movements, more attention is needed to the

consequences of the heroes/villain narrative. These complexities call for more reflection on the reliance upon this binary and the role of power and privilege in the media strategies and stories. I suggest media training for media workers in NGOs and journalist education programs that are grounded in historical and post-colonial assessments of previous campaigns and attention to the representation of race and privilege within technology and environmental issues. If media coverage of e-waste is to reflect environmental justice than there must be more prioritizing of the perspectives and voices of communities and populations most impacted by the structural violence of colonialism and the neoliberal hegemony of transnational capitalism.

APPENDIX A

TIMELINE EVENTS

before 1990

- Resource Conservation and Recovery Act, 1976
- Silicon Valley Toxics Coalition (SVTC) formed, 1982
- United Nations Basel Convention on the Control of Transboundary Movements of Hazardous Wastes and Their Disposal, 1989

1990-2000

- 1991 First National People of Color Leadership Summit, *Principles of EJ* drafted.
- 1991 Texas Campaign for the Environment (TCE) begins.
- 1995 Basel Ban Amendment
- 1997 International Campaign for Responsible Technology begins.
- 1997 Basel Action Network (BAN) formed.
- 2000 UN Global Compact launched, "the world's largest corporate sustainability initiative" (United Nations, n.d.)
- 2000 Shift towards CE/ICT infrastructure as Playstation2 with DVD announced at CES.

2001

- Computer TakeBack Campaign (CTBC) created by the Coalition of GrassRoots Recycling Network, STVC, Clean Water Action, Materials for the Future Foundation and the TCE.
- BAN leads coalition of NGOs (including Greenpeace, Friends of the Earth, Sierra Club) in a joint signed letter opposing US State Department decision to not ratify the Basel Ban Amendment.
- Apple releases iPod.
- ICT industry launches the “Global Information and Communication Technology Sustainability Initiative”, also known as the Global e-Sustainability Initiative (GeSI).

- CTBC “1st nationally coordinated activity” Computer Report Card (Wood & Schneider, 2006, p. 288)
- Tech bubble burst, 2001-2002 (fall 2002 low), 9% of Silicon Valley workforce lose jobs. (Mosco, 2004, p. 5)

2002

- Dell announces “DellExchange service,” recycling program.
- California Global Corporate Accountability Project publishes *Dodging Dilemmas: Environmental and Social Accountability in the Global Operations of California-Based High Tech Companies*.
- Dittus Communications, Dell's PR firm, contacts CTBC about next release of Report Card (Wood & Schneider, 2006, p. 288)
- CTBC begins ToxicDude campaign, Toxicdude.com launched same time as National Recycling Coalition conference "a nonprofit group that frequently gives political cover to companies targeted by activists" (Wood & Schneider, 2006, p. 295).
- International Campaign for Responsible Technology launched.
- CTBC begins extensive campaign against Dell.
- Basel Action Network and Silicon Valley Toxics Coalition releases report, *Exporting Harm: The High-Tech Trashing of Asia*.
- Computer Hazardous-Waste Infrastructure Program (CHIP) Act–proposed by Thompson, Cali-D.
- Cellphone number portability rule change

2003

- 24 states have legislation proposed regarding e-waste.
- CTBC releases 2nd *Computer Report Card*
- CTBC protests CES dressed as prisoners "chained to obsolete computer equipment" shortly before CEO of Dell gives keynote (Wood & Schneider, 2006, p. 292).
- California e-waste law passed.
- *SVTC and CTBC publish Tale of Two System* report on prison labor and Dell.
- The New Recyclable program announced by AT&T, Motorola, Sprint, Verizon through CITA

- BAN starts E-Stewards Certification program. Program begins with a pledge and evolves to a certification program.
- EU enacts the WEEE Directive. The goal of the legislation is to hold manufacturers financially responsible for disposal of electronic waste.
- Dell responds to CTBC campaign by ending prison labor for recycling.
- California bans the production and use of other types of PBDEs, penta- and octa-BDE.
- Electronic Recycler's *Pledge of True Stewardship* begins

2004

- Samsung commits to eliminating PVC and BFRs from consumer electronics. Greenpeace notes that commitment lacks " a specific timeline" (Greenpeace International, 2011).
- Maine e-waste law passed.
- CTBC releases "Poison PCs and Toxic TVs" in combination with a demonstration at the final meeting of National Electronics Products Stewardship Initiative (NEPSI) in Portland, Ore..
- Dell and HP announce commitments to increased responsibility for equipment recycling.
- Electronic Industry Citizenship Coalition created by ICT industry "to improve environmental and worker conditions" through an industry code of conduct (EICC, 2009).
- BAN publishes critique of EPA's "Plug-In to E-cycling" electronic waste recycling guidelines.
- Maine bans dec-BDE; Washington phases out all PBDEs.

2005

- California expands recycling law to include Advanced Recycling Fee, (SB 50, 2004) which requires consumers to pay a fee in advance for recycling of electronics.
- Greenpeace's Toxic Tech Campaign begins.
- Electronic Manufacturers' Coalition for Responsible Recycling (EMCRR), a U.S. coalition of electronics companies lobbying against producer responsibility, issues white paper in favor of advanced recovery fees approach to electronics recycling, which places the financial burden primarily on municipalities and consumers.

- GAO publishes report *Electronic Waste: Observations on the Role of the Federal Government in Encouraging Recycling and Reuse*
- Greenpeace releases the report *Toxic Tech: Recycling of Electronic Waste in China and India*
- BAN and CTBC releases written report and film, *The Digital Dump: Exporting Re-Use and Abuse to Africa*.
- GAO report *Electronic Waste: Strengthening the Role of the Federal Government in Encouraging Recycling and Reuse* GAO-06-47.
- Maryland e-waste law passed.
- Maker movement and *Make Magazine begin.*
- E-bay starts the "Re-Think" initiative, a "a coalition of industry, governmental, environmental and non-profit organizations to empower our 157 million registered users to take action" (eBay).
- *Nation Magazine* reports on "The e-Cycling Nightmare" (Lodish, 2005).
- Launch of GP's Green My Apple campaign (MacWorld, Jan. 2005).
- Lobbying talk by CEA, and industry groups " Electronic Device Recycling: Is a National Implementation Strategy Necessary?"

2006

- *ABC*'s 20/20 runs "Is America Exporting a Huge Environmental Problem?"
- International Conference on Chemicals Management (ICCM) agrees to "Strategic Approach to International Chemicals Management" (SAICM).
- *An Inconvenient Truth*, documentary about climate change, premieres.
- *High-Tech Trash: Digital Devices, Hidden Toxics, and Human Health*, book by Elizabeth Grossman, published.
- RoHs goes into effect.
- E-waste activist network publishes edited collection, *Challenging the Chip: Labor Rights and Environmental Justice in the Global Electronics Industry.*
- Greenpeace releases *Guide to Greener Electronics, Version 1* guide. According to Greenpeace, the report is "an instant hit with a public eager to learn about companies environmental polices" (Greenpeace International,"Electronics Campaign Timeline").
- Côte d'Ivoire toxic waste dump; activist groups like BAN receive increased media attention due to the illegal toxic waste dumping incident.

- Dell recycling program announcement
- *Toxic Sweatshops: How UNICOR Prison Recycling Harms Workers, Communities, the Environment, and the Recycling Industry*, report by Center for Environmental Health (CEH), Prison Activist Resource Center, SVTC, CTBC.
- 8th Conference of Parties to the Basel Convention has theme "Creating innovative solutions through the Basel Convention for the environmentally sound management of electronic wastes." (United Nations Environment Programme, 2006)
- Greenpeace publishes *Guide to Greener Electronics, Version 2*.
- Washington e-waste law passed.
- BAN and other e-waste network actors begin 2 1/2 year stakeholder process to integrate the EPA supported R2 standards and the E-stewards certification.
- Electronic Product Environmental Assessment Tool (EPEAT) program started.
- Registration, Evaluation, Authorization and Restriction of Chemicals (REACH) in EU
- *Time* picks "You" as Person of the Year, "exemplified this love of a seemingly immaterial world" (Miller, 2014, p. 31)
- PlayStation3 with Blue Ray announced at CES.

2007

- *An Inconvenient Truth* documentary wins two Academy Awards.
- Greenpeace publishes *Guide to Greener Electronics, Version 3*.
- "A Greener Apple", Steve Jobs press release responding to Greenpeace campaign.
- Steve Jobs calls out Greenpeace at Apple stockholders meeting. Critiques GP's methodologies in their reports about greening electronics.
- Greenpeace publishes *Guide to Greener Electronics, Version 4*.
- Greenpeace publishes *Toxic Tea Party* investigation, expands the Toxic Tech campaign.
- Greenpeace publishes 1st international version of *Guide to Greener Electronics, Indian edition*.

- H.R. 2850 Green Chemistry Research and Development Act of 2007 introduced (passes House, but doesn't move forward).
- NYT reports about lead in children's toys from e-waste.
- Greenpeace publishes *Guide to Greener Electronics, Version 5*
- Greenpeace responds to Jobs/Apple with report *Missed Call: Apple's iPhone's Hazardous Chemicals* which supported Jobs' assessment that Apple products met EU requirements (RoHS) for hazardous materials but also criticized Apple for not having full disclosure for all the materials in Apple products.
- ETBC launches Take Back My TV campaign.
- Greenpeace publishes *Guide to Greener Electronics, Version 6*.
- Greenpeace report, *Clash of the Consoles: Battle for a Green Future*.
- Connecticut, Minnesota, Oregon, Texas, North Carolina e-waste laws passed.
- Green My Apple campaign wins a Webby Award for best activist website.
- CTBC changes name to Electronics TakeBack Coalition (ETBC).
- Staples announces in-store recycling program at all stores.
- Congressman Tom Lantos sends letter to US GAO about e-waste exports. The GAO report is published four year later in July 2011.
- CEA spends $1.5 million in 2007 on lobbying federal government.
- Sony shifts to focusing on CES rather than television industry conference.

2008

- The first “Green” CES (Greer, 2008).
- Gizmodo "pranks" CES; CES bans writer "for life" (Lam, 2008).
- Greenpeace publishes *Guide to Greener Electronics, Version 7*.
- Greenpeace's 1st *Greener Electronics Product Survey* report released at CES,
- *National Geographic* publishes “High Tech Trash" article.
- S. 2669 Green Chemistry Research and Development Act of 2008 introduced. Status: Read twice and referred to the Committee on Commerce, Science, and Transportation.

- Greenpeace publishes *Toxic Tech: Not in my Backyard* report.
- Greenpeace launches Searching for Green Electronics - a survey of OEMs.
- Greenpeace publishes *Guide to Greener Electronics, Version 8*.
- TCE protests outside of Samsung Austin, TX Semiconductor factory-uses Olympic medals to compare Samsung to other OEMs.
- GAO report to House of Rep Foreign Affairs Committee on E-waste exports/toxic flows.
- Greenpeace publishes "Poisoning the Poor-Electronic Waste in Ghana" report.
- Greenpeace pressure helps to dismantle the EMCRR.
- GAO testifies before Senate Committee and publishes report *Electronic Waste: Harmful U.S. Exports Flow Virtually Unrestricted Because of Minimal EPA Enforcement and Narrow Regulation*.
- Greenpeace publishes *Guide to Greener Electronics, Version 9*.
- *60 Minutes* runs "The Wasteland."
- Greenpeace publishes *Guide to Greener Electronics, Version 10*.
- ETBC first *TV Recycling Report Card* released.
- New Jersey, Oklahoma, Virginia, West Virginia, Missouri, Hawaii, Rhode Island, Illinois and Michigan e-waste laws passed.
- BAN and e-waste actor network withdraw from R2 certification process over issues of toxic exports. E-stewards certification is expanded to E-stewards Standard.
- Second Rotation (now Gazelle) secures venture capital for reselling business.
- ETBC runs ad in Times Square over Panasonic's TV.
- Great Recession begins.

2009

- Greenpeace's releases 2nd edition of *Greener Electronics: The Search Continues* report at CES.
- Following the E-waste Trail, a Greenpeace investigation, video released.
- Greenpeace publishes *Guide to Greener Electronics, Version 11*.

- Gigaom hosts 1st GreenNet:2009 conference on Earth Day.
- Greenpeace begins "Cool IT Challenge" looking at climate change and the ICT industry.
- Dell bans exports to developing countries.
- FCC mandated Digital Television Transition switchover.
- PBS/Frontline airs “Ghana: Digital dumping ground.”
- Greenpeace paints HP roof “Hazardous Products” (Fallon, 2009).
- Greenpeace publishes *Guide to Greener Electronics, Version 12*.
- Foxconn worker suicides begins to receive attention, July 2009 - August 2010 (14 workers)
- UNEP releases report *Sustainable Innovation and Technology Transfer Industrial Sector Studies: Recycling: From E-Waste to Resources*
- *Newsweek* Green Rankings
- Greenpeace publishes *Guide to Greener Electronics, Version 13.*
- Greenpeace publishes *Cool IT Report, Volumne 2*
- Steve Jobs resigns from Chamber of Commerce, “accusing the lobby group of planning to use its funds to oppose climate change legislation in Congress.” (Lombardi, 2011)
- *The Amazing Race* uses e-waste disassembly in episode. VCR dismantling in Vietnam as part of the reality TV show competition.
- Indiana, Wisconsin e-waste law passed.
- Pike Research publishes *Electronics Recycling and E-Waste Issues* market research publication.

2010

- CES 2010
- Greenpeace publishes *Guide to Greener Electronics, Version 14*.
- Gizmodo publishes leaked iPhone 4 prototype.
- Greenpeace publishes *Toxic transformers: The Hazards of Brominated and Chlorinated Substances in Electrical and Electronic Equipment* report.

- Greenpeace publishes *Guide to Greener Electronics, Version 15*.
- GAO Report *Electronic Waste: Considerations for Promoting Environmentally Sound Reuse and Recycling*.
- Gizmodo banned from Apple's Worldwide Developers Conference keynote.
- Modular mobile phone, Phoneblocs, debuts on YouTube.
- Greenpeace publishes *Guide to Greener Electronics, Version 16*.
- Justice Department's report on toxic waste and prison labor release - reveals prison labor still being used in federal prisons to dismantle e-waste and that waste was exported.
- Vermont, South Carolina, New York, Pennsylvania e-waste law passed.
- Dodd-Frank Act: requires disclosure of conflict minerals (i.e. gold, tungsten, tantalum, tin).
- Electronics Recycling Coordination Clearinghouse begins.
- CEA and the Information Technology Industry Council (ITI) seek injunction against NYC to stop the city's e-waste recycling program.

2011

- India passes e-waste law.
- ReCelluar layoffs begin. Attempts to shift towards recycling/refurbishing smart phones.
- United States government releases a report encouraging the phrase “used electronics” instead of “electronic waste or e-waste” (Interagency Task Force on Electronics Stewardship, 2011, p. 5).
- IFixIt launches Dozuki software project for repair manuals
- Apple Corporation bans an iPhone game app, *Phone Story*.
- Greenpeace publishes *Guide to Greener Electronics, Version 17*, includes energy, product design and operations
- Utah e-waste law passed.
- Federal gov announces they are considering which certification to use for government e-waste.
- EPA gives five year grant to UN University.

- MIT Senseable City Lab-Backtalk exhibit opens at Modern Museum of Art (MOMA) that visualizes e-waste flows: "Talk to Me: Design and the communication between People and Objects."
- CES entertainment subsection begins.

2012

- Fairphone reaches 5000 initial pre-orders
- Apple removed from EPEAT certification for laptops.
- CNET investigates iPhone life cycle, multi-article feature on tracing life cycle of iPhones.
- Federal government prohibits government contractors from dumping electronics in landfills.
- Greenpeace publishes *Guide to Greener Electronics, Version 18*.
- Massachusetts passes the Automotive Right to Repair Act in Massachusetts (H. 4362).
- Federal government requires vendors to use R2 certified vendors.

2013

- IEEE announces support for cellphone repairability.
- Staples agrees use E-stewards certified recyclers.
- ITI advocates for changing definitions of waste vs. products at Basel Convention meeting.
- Gazelle ends partner program with Walmart.
- Digital Right to Repair Coalition (now The Repair Association) forms.
- AT&T, CTIA publically support of Unlocking Consumer Choice and Wireless Competition Act 2013 (phone unlocking bill).

2014

- Unlocking Consumer Choice and Wireless Competition Act made law.
- You Own Devices Act (YODA) proposed, H.R. 862.
- California announces $23.8 million settlement with AT&T for environmental violations.

APPENDIX B

CODEBOOK

Note: Codebook not in original format due to University of Oregon Graduate School formatting requirements.

Codebook Contents

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General instructions

Code the article text–the written content of the article. This includes the title, lede, or subhead sentences included before the beginning of the article.

If there is a duplicate sentence due to article formatting–usually a lede or subhead sentence that is repeated at the top of an article–do not code this sentence twice. Only code once. BUT, if it is worded differently (and thus is a different sentence), then code as part of Section 1. Mark a line through any duplicate sentences that were not coded.

Do not code graphics, tables, images and captions of graphics. For LexisNexis articles, stop coding topics, sources, and devices at author's contact information. Some articles may have a list of links of related or similar articles–do not code these. Some articles may have information about graphics or images after author's contact info that should be coded for article type codes.

Please mark up the articles for coding purposes.

Make a note of any questions or comments about the article or coding process on the coding sheets.

Article ID and Section Break

1. Note Article ID and Coder ID on each page of coding sheets.
2. Mark a line on article denoting where 5th paragraph ends for coding Section 1. Count paragraphs after author's name, date line or a subhead sentence (some sort of summary sentence at the top of the article, sometimes in bold). If article word length is under 250 words, then code entire article as section 1.

Coding Decision: What if a Q&A is split between sections? Include a question and its answer in the same section. If the question falls at the section break, include the question line in the following section (section 2). See example in (Ulanoff, 2003).

3. Read entire article.

Section 1

4. Read and code article through Section 1.
5. Code for topics, Section 1.
6. Code for sources (direct and indirect quotes), Section 1.

Section 2

7. Read remainder of article (Section 2).
8. Code for topics, Section 2.
9. Code for sources (direct and indirect quotes), Section 2.

Coding for Whole Article (Sections 1 & 2)

10. Code for types of devices mentioned in whole article.
11. Code for type of article.
12. Confirm coding choices. Re-read article if necessary.

Topics–Instructions

A topic is discussed more substantively than a mention of a key word. Topics are contextual. Use the range of possible relevant details in the topic definitions to decide if a topic is discussed.

More than one topic can be coded for per article. Topics are not exclusive.

Use the questions at the top of topic pages to help guide your thinking about the topic. A yes or no answer to the questions likely indicates that the topic is seen or not seen in the article section.

* How much content determines a topic? Think about topics as themes. Does the section of the article reflect the overall topical theme, or is it a just a few words?

* Ideally there will be a clear sentence or two that primarily discusses the subject matter related to the topic. A topic could not have a full sentence, but could be coded as a yes if the entire section has a few mentions of key concepts relating to a topic scattered throughout the section.

example: If obsolescence and obsolescent-type adjectives or verbs are mentioned as part of three different sentences throughout a section, this article section would be coded as obsolescence.

* Code beyond keyword mentions.

Use the code book to get a sense of the range of ways a topic could be discussed. Use keywords and phrases to help identify where a possible topic exists, but the article should have a more substantive discussion than just the inclusion of a keyword.

example: The word "consumers" is used as the subject of a sentence but nowhere else in the article is consumerism or ideas and keywords related to consumerism topic mentioned. This would not be coded as consumerism. See pages 368-369 for specific coding decisions about Consumerism [T12].

* Sourcing choices and topics will likely relate–you may see sources that are related to the specific topic.

example: In articles that discuss legislative issues or policy, you may have sources from government agencies.

* If you see actors that reflect the topic, but no quote from the actor, that is fine.

example: A discussion of corporate policies may discuss specific corporations but may not have a direct or indirect quote from the corporate actor.

Topics–Instructions

Coding Decisions

Title/Lede/Subhead Sentence: If the topic is mentioned in the title or sentence above the author's name (subhead sentence), that gives it more weight towards a YES decision for Section 1.

example: If there is a small reference in the 4th paragraph and the topic is mentioned in the title, then this would be coded as that topic. But if there is *only* a small mention in the 4th paragraph (a word or two), then the topic would be coded NO.

Direct quotes: If a direct quote is predominately about a topic, or if direct quote is from an actor that relates to the topic, this gives more weight to the coding decision of YES for the topic in either section. Editing choices that include direct quotes have the effect of highlighting or calling attention to the issue by choosing to quote someone about it.

Indirect quotes: If a topic's content is contained in an indirect quote, pay attention to the actor of the indirect quote. This may help with a coding decision.

Multiple codes: There can be multiple codes for one paragraph, if there is enough discussion or section of a paragraph/sentence that gives enough for a topic. This would be a full phrase or full component of a sentence, not just a word or two.

example: "He also said <u>developed nations had started programs to buy back outdated equipment [T1]</u>, and **that pressure from Greenpeace and other environmental groups had prompted *major electronics and phone companies [T6]*** *to start designing more environmentally friendly products." [T3]* (Casey, 2008)

T1 (EPR) <u>content underlined</u>
T6 (activism/advocacy) **content bold**
T3 (product design) *content italics*

Topic Variables

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T1	Extended Product/Producer Responsibility	355
T2	Legislative issues or policy	356
T3	Electronic product design improvements	357
T4	Certification programs	358
T5	Electronics recycling sector/industry	358-359
T6	Activism, advocacy	361-362
T7	Reports / report cards	362-363
T8	Justice	363-364
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T23	Anthropocene/environmental context	379-380

T1 Extended Product/Producer Responsibility

Does the article discuss companies' responsibility with their products' life-cycle?

Does the article discuss electronics take-back programs? (Not certification programs!)

Extended Producer and/or Product Responsibility

Extended Producer Responsibility (EPR) "extending companies' traditional responsibility to include products' impacts throughout their life cycles, including end-of-life responsibility" (Smith, Sonnefeld, & Pellow, 2006, p. 10).
example: "manufacturers balk at taking on the responsibility of disposing of systems they sold years ago (something manufactures in Europe and Japan already have to do)" (Ballinger, 2003).

* Could be discussed in relationship to impending legislation requiring product take back. If so, article could also be coded as legislation/policy [T2].

* EPR can be mandated by law as in Europe (see example above) but can also be voluntary (i.e. Apple's own program, regardless of a law requiring them to be responsible for old iPods).

* Could be discussed in relationship to product design and packaging, so some articles may have additional codes for product design [T3].

Product Take Back Programs

Corporate or industry sponsored electronics take-back program. This is a program that a corporation has set up for electronics recycling where a product is taken back "at the end of its useful life (i.e. when discarded), either directly or through a third party" (Byster & Smith, 2006, p. 212).

* The program can either be run by a producer/manufacturer of electronics (like Apple or Dell) or a distributor/retailer (like Best Buy or Staples).

> *examples:*
> Apple's program to buy back iPods from consumers who get a gift card in exchange for their old product.
>
> Best Buy's "e-cycle" program.

* Could be criticisms of EPR policies or lack of policies. Could offer critique of take-back programs (generally or about a specific program).

T2 Legislative issues or policy

Does the article discuss any level of government policies related to electronic waste or computer recycling?

* Discussions of legislation concerning e-waste, used electronics, end-of-life electronics, or electronics disposal at any level of governance: international, transnational, national, state or local governments. Lobbying activities may be discussed.

* Governmental reports and research results relating to electronic waste or end-of-life electronics.
example: StEP - Solving the E-Waste Problem: Annual Report by United Nations Environment Program.

* Discussions of possible policy, critiques of policy, or implementation of policy.
examples: mandates; eco-fees; disposal bans, advanced recycling fee

* References to a "patchwork" of rules or policies.

* Stories that have quotes from government and transnational governance actors (Sources E, F, G, H) may often be coded as legislative issues or policy [T2].

* Advocacy or activism actors may be seen in articles with legislative topics.

Policy examples:

Basel Treaty or the Basel Convention on Control of Transboundary Movements of Hazardous Wastes and their Disposal.
Aims to reduce transnational/boundary moving of waste and reduce creation of hazardous waste. Regulates the exportation and disposal of toxic and hazardous waste. Electronics contain substances that are regulated by these treaties, thus the disposal of electronics becomes an issue of toxics and hazardous waste.

Basel Ban: Hazardous waste cannot be exported from OECD countries to non-OECD countries. OECD=basically global north/developed/high income countries and non-OECD=basically low income, global south countries.

The Waste Electrical and Electronic Equipment (WEEE) Directive=WEEE.

Restriction of Hazardous Substances Directive (RoHS Directive)=RoHs.

Electronic Waste Recycling Act and Advanced Recovery Fee system (California SB 20 & SB 50).

Responsible Electronics Recycling Act (HR 2284, S1270, HR 2791, S2090).

T3 Electronic product design

Are "green," environmental, or sustainable product design elements discussed? This could be improvements to existing products, problems with product design, or future product design innovations.

This topic is about the entire product life cycle and not specifically about the corporate policies or programs related to disposal–however, the product's design and material life cycle could potentially affect how disposal happens. In other words, this topic can refer to the entire chain of production–i.e. reducing a toxic mineral in the production of a laptop, using recycled parts or elements in the production of a cellphone, or changing the design so a part can be replaced instead of disposing of the product.

* Materials used in manufacturing processes.
    example: a change in the materials used in production of Apple computers.

* Article discusses materials in electronic products without discussing harm/toxicity concerns.
    example: the material in a new phone will make the product weigh less.

* Design elements are discussed in relation to how they have or could improve an environmental problem.
    example: a new battery design that allows the user to access and replace the battery rather than having to get rid of the device as a whole.

    example: "use fewer toxins, design devices that could be easily reused" (DePalma, 2005).

    example: "a virtual desktop project under which IT aims to eventually provide all employees with virtual desktops. This will help cut down on the amount of e-waste the company generates and reduce energy consumption. JM Family estimates that the thin clients will use 80% less energy than traditional PCs." ("Jm family; a systematic approach to sustainability includes a high-powered solar array.," 2011)

* Design elements includes the purpose of the device. A single purpose device (like an e-reader) is used for one purpose (reading articles, books). A multi-purpose device (like an iPad or tablet) can be used for a variety of activities (internet searching, reading books, games).

* A critique of a product design or promotion. This could be general criticism or could discuss the product in terms of greenwashing. Greenwashing refers to unsubstantiated terms like "eco-friendly" or "environmentally preferable" (Electronics TakeBack Coalition, ND, p. para 1–2). Article could also be reflective of greenwashing by vaguely talking about a green innovation for a new product.
    example: "designing more environmentally friendly products" (Casey, 2008)

T4 Certification programs

Are electronics recycling certification programs discussed?

A certification program certifies that electronics recycling programs are practiced according to a range of social and environmental justice principles, depending on the various standards that each certification program determines. These programs have arisen due to the absence of national regulations regarding the disposal of electronic waste.

* Could be criticism or promotion of certification programs.

* Certification programs could be discussed in connection with activist groups like Basel Action Network. *examples:*

The Electronics Recycler's Pledge of True Stewardship
e-Stewards (1.0 or 2.0)

* Certification programs could be discussed in connection with recycling sector and electronics industry lobbying organizations. *examples:*

Responsible Recycling Practices (R2)
Recycling Industry Operating Standard (R2/RIOS)
ISO 1400
Electronic Product Environmental Assessment Tool (EPEAT)

T5 Electronics recycling sector/industry

Is the electronics recycling or used electronics industry or infrastructure behind the e-waste disposal chain discussed?

Any company or organization that works on electronics recycling or participates in the used electronics infrastructure (recycling, disposal, reuse). This is also includes organizations that collect electronics to be recycled or reused (like Green ATM or Goodwill). Often a spokesperson, company representative, or company document (press release, website) will be quoted either directly or indirectly.

* For-profit organizations involved in electronics recycling. Often part of the larger sector of scrap and metal recycling. Also, business lobbying organizations that these companies participate in. These lobbying coalitions might publish reports or press releases. May describe or discuss the industrial electronics recycling sector or the technologies that the industry uses.

examples: shredding technology, urban mining, e-scrap recycling, waste distributors, waste management, waste-trading interests

T5 Electronics recycling sector/industry (Cont.)

* Talks about the geography of where the e-waste disposal chain happens, or discusses specific locations and facilities or the processes of how waste is moving from site to site, through a chain of multiple plants and facilities.

example: "convoluted paths of e-waste from Seattle to recycling plants that in many cases were on the other side of the country" (J. M. Foster, 2011)

* Discusses reusing or rebuilding consumer electronics. Donation programs of old or used computers. Used electronics businesses which buy used or old phones and devices and then resell to other people or operations.

examples: "reuse stream" of electronics; "computers' second lives" (J. M. Foster, 2011)

* Non-profit organizations can be included if they participate in reusing computers, redistributing used computers or collecting used electronics.

examples: Goodwill, World Computer Exchange, NextStep Recycling, FreeGeek, Rechargeable Battery Recycling Corporation, Call2Recycle

* Article that highlights industry perspectives, conditions and/or predictions for e-waste issues. Could include publications or reports by industry coalition. May include quotes or references to industry coalitions or lobbying organizations.

examples:
Coalition for American Electronics Recycling
GeSI Supply Chain Working Group
Electronic Industry Code of Conduct
The Institute of Scrap Recycling Industries
SMART 2020 Report

* Articles that discuss the business or economic side of the electronics recycling sector: profits, investments, start up capital for new e-waste disposal operation or used electronics businesses.

* Could discuss issues of corruption, illegality, unscrupulous business practices in the sector.

examples: "netherworld of the global e-waste chain" (J. M. Foster, 2011) (Article_12090)
"ugly business…cheaper to export…profit-hungry entrepreneurs" (Bodeen, 2007)

* Discusses "Fair Trade Recycling"

T5 Electronics recycling sector/industry (Cont.)

* Article includes mentions, discussion, quotes from recycling and used electronics companies: (Complete description under Actors: C, p. 36 of codebook)

Advanced Electronics Recycling
Call2Recycle
Cal Micro Recycling
Citiraya Diversified Recycling
CollectiveGood International
Diversified Recycling
Earth Friendly Recycling
e-Cycle
ER3 (Electronics Recycling 3 LLC)
Fair Trade Recycling
Good Point Recycling
Goodwill
Green Citizen
iFixit.com (see coding decision, pg. 367)
Microsoft Authorized Refurbisher
Rechargeable Battery Recycling Corp.
Recycla
Renovo Data Services
Sims Recycling Solutions
United Recycling
Universal Recycling Technologies
Waste Management Recycle America

***Coding Decisions*:**
* This topic differs from EPR [T1] because EPR topic articles are not often discussing what happens to products once the company receives them back. So an article about a Best Buy program may not mention where or how Best Buy recycles the used electronics.

* If article is focused on maker projects, Do-It-Yourself projects that use recycled or reused electronic parts, then this would be coded under Art/Design Projects [T11]. If primarily about an individual's creative reuse of electronics or a "recipe" or a how-to-reuse electronics into other things guide for individuals, also coded as [T11]. However, if discusses the infrastructure or industry side of an art project, then would also be coded [T5].

example: an art project is featured in a story [T11]. During the article, the artists discuss how they acquire the used electronics for their art, mentioning a electronics recycling company:
"made from old pieces of tech donated by Chilean recycling company Recycla" (Cha, 2012)

This is coded as [T5] in addition to [T11] because the sentence implies action by Recycla–it is donating goods (old electronics) to the project. As a public relations strategy, this donation worked to get Recycla a positive mention in the media story through making a donation to an art project.

T6 Activism or Advocacy

Does the article discuss activism or advocacy about e-waste issues? Is environmental activism discussed?

* Types of activism or advocacy activities include: a protest, demonstration, civil disobedience, leafleting, picketing, letter campaigns, marches, a boycott, stockholder meeting disruption. See e-waste network & environmental actors list (pg. 381 in codebook) for organizations that may be mentioned.

example: A banner hang at Dell's headquarters by Greenpeace. A disruption of an Apple stockholders meeting. A social media campaign about a specific brand of electronics.

* A non-specific mention of activism type activity may suffice. Can be about environmental activism, as related to the lifecycle of electronics. If the article is connected to e-waste and protest/advocacy is discussed/mentioned then code YES.

examples: Article references about protests about mineral extraction sites and how recycling electronics potentially reduces raw mineral extraction. Also has a direct quote that discusses the protests later in section which adds weight to coding decision (Bradsher, 2011).

"an impassioned campaign by environmentalists" does not really say what the campaign did or which specific organizations were involved, but it would count as a [T6]

* Verbs and phrases that signify activism or advocacy activity: "collectively advocate" "pressure from environmental groups"

examples: "environmental groups have been sounding the alarm for some time over the volume of waste generated by the electronics industry" (Gilbert, 2005).

"urging the company to do more to combat waste….it will press Apple to expand its free recycling program to cover computers and monitors and accommodate consumers who don't live near an Apple Store." (Gilbert, 2005)

"an impassioned campaign by environmentalists" "a national movement to address…the dark side of the high-tech revolution" (Levy, 2002)

* A profile of an activist organization, campaign or action. This could also be describing a public relations or messaging campaign.

example: The Green My Apple Campaign (Greenpeace)

T6 Activism or Advocacy (Cont.)

Coding Decisions: If activist groups are specifically mentioned in a section, this weights the decision towards [T6]. Possibly may not see quotes from activist groups but mentions of organizations.

example "pressure from Greenpeace and other environmental groups had prompted major electronics and phone companies to start designing more environmentally friendly products" (Casey, 2008).

* If article section is primarily about the results of research report or report card, then code as [T7]. The [T6] code is more focused on actions and activism generally. If the specific reports or research is mentioned, then code as T7. But, an article could be coded as both if activities other than the publication are mentioned.

T7 Activist reports/report cards

Does the article discuss advocacy or activism reports or report cards about the electronics industry?

* Report cards: These advocacy and activism reports highlight "leaders and laggards" in e-waste issues, environmental performance, etc. (Wood & Schneider, 2006, p. 288). Computer TakeBack Coalition's Computer Report Cards, Greenpeace Green Electronics guides

* Reports: Reports can be text (like a white paper/research report), or multimedia (like a short film or photo documentation project). Reports also function as investigations into e-waste problems. In some ways they are similar to investigative journalism, except that the publishing organization is an activist group instead of a newspaper and there is a clear position of social justice and a call for change.

* These reports and report cards must come from e-waste network and environmental/human rights activist organizations. See complete list of these organizations on pg. 381 in codebook.

Coding Decision: If an article is discussing a report published by a coalition of industry and e-waste businesses, code this as used electronics & recycling industry [T5]. If a report is published by a government, code as legislative [T2] if appropriate. Often these reports will be used as sources of information in an article, but the article content may not be about legislative topics.

Coding Decision: If article is referencing journalistic accounts of e-waste issues, this is not coded as T7. These articles would be coded according to what content topics the article discusses. Article MUST be discussing the actual reports (like the findings, recommendations, or results) produced by activist organizations to be coded as T7.

T7 Activist reports/report cards (Cont.)

* An article covers a report card published by Greenpeace, but is not discussing activism of Greenpeace. So coded as T7, not T6.

example: "Every year, Greenpeace releases its 'Guide to Greener Electronics'–the one released last September was the 13th edition of the publication. I'm a long-time Greenpeace supporter and personal electronics user, yet I'd never even heard of the guide. Have you?" (Laidlaw, 2010)

Activist and advocacy research publications

Exporting Harm: The High-Tech Trashing of Asia [video & report] (BAN)
Digital Dump: Exporting Re-use and Abuse to Africa [video & report] (BAN)
Brominated Flame Retardants in Dust on Computers [report] (CPA & CTBC)
Calling all cell phones: Collection, Reuse, and Recycling Programs in the US [report] (INFORM)
Toxic Tech: Recycling Electronic Waste in China and India [report] (GP)
The Story of Electronics [video] (Story of Stuff Project)

T8 Justice

Does the article discuss e-waste as an issue of justice, injustice, unfairness, or inhumane practices?

Institutional racism and classism in the regulation of environmental issues, particularly toxic disposals, create significant health risks for low-income, minority communities (Anand, 2004; Swain, 2009). Environmental justice links "social justice concerns like self-determination, sovereignty, human rights, social inequality, access to natural resources, and disproportionate impacts of environmental hazards with traditional working-class environmental concerns like worker rights and worker heath and safety" (Taylor, 2000).

* Responsibility for problems could be assigned. The article may assign blame or responsibility for e-waste issues–there are numerous actors and institutions and systems that could be connected.

* People/groups that bear the impact of problems could be assigned. The article may discuss who or where the problem of e-waste disposal is felt the most. Article could direct "attention to the impact of illegal e-waste exports on vulnerable populations" (Edge, 2011, p. 158).

T8 Justice (Cont.)

* Description of e-waste issues implies some sort of inequity, often related to race, class, or nation/geographic status. This may not be explicitly said but could be implied with word choices.

examples: abusive, lack of environmental standards, environmental and/or socially irresponsible exploitation, enduring health risks, desperate, dirty secret

* The article is asking questions about the value or impacts on people's lives and/or the environment.

example: "no peoples should be disproportionately burdened from environmental harm simply due to their economic, racial, or other status" (Puckett, 2006, pp. 229–330)

* Phrases relating to justice, unfairness, or inequalities are explicitly mentioned. This may be seen in direct quotes from actors.

examples:

"unable to accomplish even the prerequisite steps of addressing the inequities and exploitation made possible by globalization" (Casey, 2008)

"end the egregious immoral form of injustice visited upon developing countries from hazardous waste" (Casey, 2008)

"toxic imperialism" (Anand, 2004, p. 64)

"export of such wastes to those low-wage communities still would be affront to the principle of global environmental justice" (Puckett, 2006, pp. 229–330)

"passing the toxic buck" (Puckett, Westervelt, Gutierrez, & Takamiya, 2005, p. 31)

Coding Decision: Articles that discuss justice topics but don't note a geographic location about the issue are still coded as T8.

T9, T10 Locations impacted by or responsible for e-waste

Does the article locate where e-waste issues are problematic? Does the article discuss who or what geographic area is impacted by or responsible for e-waste?

* Articles can be coded for both areas (T9 and T10) if both geographic regions are discussed.

* A region could be discussed in terms of both responsibility and impacts.

example: An article could discuss corruption and lack of environmental standards in China as contributing to e-waste issues, but could also discuss negative environmental impacts on Chinese communities and e-waste dissemblers health. Both responsibility and impacts are assigned to the same geographic area.

T9, T10 Geographical locations impacted by or responsible for e-waste (Cont.)

***** There must be enough content that assigns responsibility/impacts.

example:

"Every year in the *United States, 40 million to 50 million mobile phones face one of these two fates*, said Seth Heine, founder and president of CollectiveGood International, a company that sells used phones in Latin America. *How many end up in the garbage is unclear. In Europe, where more research has been done on the subject, less than 15 percent have been thrown out…*" (Guernsey, 2002)

Italics = Coded as T9 because there are multiple mentions of T9 geography and responsibility (US old phones/upgrading rates, Europe phone trashing rates).
Underlined = Not coded as T10 because it just references that a company is selling phones in Latin America (see coding decision below).

"How the phones are recycled is another question. This week, five environmental groups released a report that pointed to environmental hazards from the recycling of electronics equipment in India, Pakistan and China, *much of it Western refuse.* In some cases, the report said, the recycling techniques expose workers to toxic material. Because of the number of intermediaries, it is hard to tell what becomes of equipment given up for recycling. The International Association of Electronics Recyclers has started a certification program to weed out companies that may be dumping products on poorly run operations in developing countries."

Italics=The brief mention *"much of it Western refuse"* can be coded as T9 because it assigns responsibility to Western locations for the trash.

Underlined=The section has multiple mentions of T10 geographic impacts of e-waste issues.

Coding Decision: Content that locates the article's subject or topic but is not connected to impacts/responsibility is not coded for T9/T10 geography.

example: An article discusses where a bill or policy is taking place is not coded for Geography of Impacts/Responsibility. If the article also discusses the motivations for a bill or policy, why it's important for a global north location to change their practices, etc. then could be coded as T9.

T9 Geography of responsibility and impacts: Global North, OCED countries, developed countries

United States, Canada, Mexico
Europe/European Union, United Kingdom, Israel
Australia, New Zealand
South Korea, Japan

Chile is an OCED country, but is also in the global south. If you see a reference to Chile, use the context of the article to determine how Chile is being discussed.

Western may be used, but be careful to code for amount of discussion/topic. See example on previous page.

T10 Geography of responsibility and impacts: Global South, Non-OCED countries, less developed countries

* Phrases to watch for: developing countries, less developed countries, under developed, low income countries, global south, poor countries, poverty stricken countries
 * whole continents or regions may be referenced (Africa, Asia, South America, Asian-Pacific countries).
* Likely to see: China, India, Ghana, Nigeria

OCED = Organization for Economic Co-operation and Development

T11 Art/design projects

Are art projects discussed in the article? Are projects that emphasize creative or crafty uses of used electronics or e-waste discussed?

Possible types of projects covered:
* Educational projects: bringing attention to e-waste issues through art / design projects
* Olympics 2010: medals for the winter Olympics were made from electronic waste.
* Creative reuse projects: making something new that's not necessarily a new electronic device but something has been done with the old material to create new things in a creative ways. *example:* making a chair out of e-waste

* DIY (do-it-yourself) technology projects: DIY repair information; Do-It-Yourself projects that use recycled or reused electronic parts; possible references to the maker movement, Hackerspaces, Maker Faires. People taking old equipment and reprocessing it into something new, not necessarily to make a profit, but more about the idea of lifting up the "hood" of our devices, like learning to work on a car or learning to work on your phone and fix it.

T11 Art/design projects (Cont.)

* If primarily about an individual or instructions, or how-to reuse electronics into other things, also coded as T11. See below for specific coding info about the iFixit organization.

Coding Decision: iFixit

* Code as T11 when article is focusing on iFixit as an organization or iFixit's projects. BUT, if the article is discussing or examining issues that are raised by iFixit spokespersons, then focus on the content of the issues.

* An article may use iFixit as a source to discuss design flaws of a new Apple product. This would be coded as T3.

* Or an article may use iFixit information or spokespersons to discuss environmental justice issues with poorly designed products. This could be coded as possibly T3 (product design) and/or T6 (activism/advocacy), T4 (certification), (T8 justice), or T13 (obsolescence).

* Finally, an article may discuss iFixit as a business and organization, in the context of the infrastructure of used electronics businesses, so that story would be coded T5 (electronics recycling sector).

"A guy who takes computers and gadgets apart for a living **is calling shenanigans on ultrathin notebooks getting the coveted EPEAT Gold rating from the green electronics ratings group.** iFixit founder and CEO Kyle Wiens in a blog post on Tuesday called the recent findings of an independent EPEAT test, which certified notebooks like Apple's MacBook Pro with Retina *display with the highest possible rating for recyclability, "a clear case of greenwashing."* He added that **the group's environmental standards had been "watered down to an alarming degree."**

Wiens, *whose job is to dissect gadgets and create easy-to-understand repair guides for users, is passionate about "sustainable technology" or the recyclability of products and their contribution to electronic waste,* as I learned when talking to him for a story last month. *His attitude is that when products are hard to repair or are not built to last more than two or three years, they are more easily tossed in the landfill, and contribute to e-waste."* (Ogg, 2012)

underline=T5 (electronics rec. sector), **bold=T4 (certifications);** *italics=T3 (product design);*

T12 Consumerism

Is consumption (consumerism, mass consumption) of electronic devices discussed? Are processes that encourage, expand, or profit from increased consumption included in the article? Does it discuss an industry event that highlights or promotes purchasing and consuming devices?

An article could discuss consumers and consumerism, but an article could also be reflective processes like public relations in that the article itself is generating coverage and creating attention on the products the companies are trying to sell. This could be seen in articles that focus primarily on the story being about the product launch, an event that highlights the spectacle or magic of the commodity.

* New product launches or announcement events or company promotions. Apple is particularly known for their product launches. Stories could also be about consumer and/or fan anticipation of products.

examples: Apple product launch press event; stories about people waiting in lines overnight to purchase new iPhones.

* Industry conferences. Similar to new product announcements, these events are where multiple brands and products are launched and displayed.

examples: Consumer Electronics Show, MacExpo, Mobile World Congress

* Product and/or brand marketing and advertising–could be descriptions, critiques, or promotional articles about a company or product line.

examples: articles about ad campaigns for new products ("I'm a Mac: I'm a PC" commercial); stories about corporate events, often public relations and marketing events.

* Article discusses activities related to consumerism–the processes of buying, purchasing, and using (or enjoying, playing, or working) electronic devices. Can also discuss consumers–the persons who are consuming. Could discuss access to consumer electronics and ICTs. Could discuss demographics and sales data about products or customer demands for products. Could discuss company profits, share prices, projected sales or losses.

examples: information, statistics, or demographics about who is purchasing and using what devices; how many products were bought, the expected rates of purchases of laptops, tablets, phones, etc.

* Product reviews. Article could review new devices. These could also be negative or critical stories. Articles may or may not discuss environmental and social justice issues related to devices.

T12 Consumerism (continued)

Coding Decision: If article is reviewing product and discusses product design or design issues that meet the qualities discussed in T3 (product design), then code as T3. If article is primarily focused on features and qualities of the product, then code as T12. If review is discussing types of users and/or consumers (like different potential uses for a device or product), this lends weight towards a T12 code. Occasionally, a product review may be coded as T3 and T12

Coding Decision: Brand fandom is discussed. If author of story self-identifies as fan, geek, user of the brand, read carefully because article may be reflective of public relations (like giving a free device to a known fan of the brand and having them write about the product [most likely favorably]).

examples: as a long time Apple fan boy, I struggle to find something to complain about with this new ____

As a lover of all things Android…

These type phrases give added weight to a decision of coding T12, especially if article is a review that also addresses product design [T3].

Coding Decision: Article that discuss changing consumer behavior or raising "consumer awareness" (J. M. Foster, 2011) should be read closely to determine if actions trying to do this are related to activist orgs, like a boycott campaign (T6), or art projects (T11).

If consumers are mentioned as a target of the campaign or project, then code related to the actors initiating the project (so an art project that aims to raise consumer awareness is T11, even though consumers are mentioned).

Coding Decision: Article discusses consumerism generally or an issue related to consumption of products not specifically electronic devices. Electronic waste figures in the overall story, but the article discusses other consumerism or consumption related to other types of products. May discuss product recalls, prices of products related to supply/demand issues. Code as YES, T12.

If article is about consumerism/other types of products but has no mentions of electronic waste or issues connected to e-waste, then Code NO. (Note: There shouldn't be any articles like that because all articles should have some inclusion of words electronic waste, e-waste, etc.)

T13 Obsolescence

Does article discuss planned obsolescence, Moore's law, or general obsolescence of electronic devices?

* Obsolescence is the idea that things become obsolete, meaning they do not work any more, they do not work as fast, they are no longer compatible and are no longer as efficient.

example: cell phones: parts are not replaceable, have to get a new phone instead of fixing the battery or the operating system is no longer supported so doesn't work as well

* Planned obsolescence is where that is either intentionally or what some corporations might argue is reflective of the rate of speed of development and innovation (Moore's law). Others argue that there is some planning involved–things are designed to break quicker so that consumers have to purchase more often.

* Articles may explicitly discuss planned obsolescence or may imply through criticism of design issues. May discuss repairing devices and sustainability issues with new products over creating better conditions to repair devices.

* Moore's law: processing speeds of computer chips doubles every 18 months; exponentially changes in capability of technology, thus "requiring" new products that can fulfill the potential and increases of processing power.

* Article reflects issues of speed, time, upgrading, the "market," or capitalism. Word choices may reflect these concepts.

example: "when a faster computer or sleeker phone enters the market, our intimate companions are promptly discarded" (J. M. Foster, 2011)

Coding Decision:

Articles about product design [T3] may also be coded as obsolescence [T13] depending on topic scope requirements–is there enough discussion of obsolescence to warrant the code?

If use the specific word "obsolete" (or some version of) this can give more weight to coding decision of YES. BUT must not be just a keyword that is used simply as an adjective.

YES example: All content contained in section 1, entirety of content contributes to obsolescence coding YES, but inclusion of obsolete increases the weight towards the decision.

"Yet, for all the love we lavish on them, when a faster computer or a sleeker phone enters the market, our intimate companions are promptly discarded…transforms obsolete electronics" (J. M. Foster, 2011)

T13 Obsolescence (Cont.)

NO example: obsolete used as an adjective or synonym for old used to describe the technology or waste (i.e. piles of old computers OR piles of obsolete computers=same thing). If that was the only mention of the word, does not automatically create a YES decision. Must discuss the processes of going obsolete (see above).

"Yet another disposal option for obsolete or deceased hardware is the …" (Musgrove, 2005). This is using "obsolete" as a fill in for old/used. The section is not discussing how or why the hardware became obsolete.

T14 Data security

Are issues of data security discussed as part of e-waste issues?

When electronics are disposed, what happens to the data on hard drives in devices that are disposed?

* Data security involves wiping, deleting, destroying hard drives of computers, phones, etc.

* May not refer to specifically to hard drives, think about mobile phone data. Mobile phone data may be referenced not by talking about the hard drive but the phone in general.

* Discusses incidents where data was acquired after devices were recycled or disposed of.

* Talks about laws requiring certain data security disposal processes, like HIPAA (Health Insurance Portability and Accountability Act).

* May discuss problems related to rebuilt electronics and issues of data contamination, national or industrial security.

example: Counterfeit chips sold to U.S. military and government contractors. These chips are made from disposed e-waste that was shipped to manufacturing areas like China. The processers are taken apart the chips are then resold back to the United States, especially military institutions. There are concerns that the reused or rebuilt chips could contain compromised or hacked features that allow backdoors to criminals, enemies, etc.

T15 Prison labor

Does the article discuss or refer to the use of prison labor in electronics recycling or disposal?

Prison labor is using prisoners to recycle and dismantle old, broken, and used electronics.

* Might be discussed in combination with articles about Dell or Hewlett Packard.

* May discuss working conditions of electronics disassembly. If so, then can also be coded as disassembly (geographical specific–i.e. if talking about North American prison labor, then coded as T15 and T16).

* Organizations that are involved in prison labor:
    Bureau of Prisons
    Federal Occupational Health Services
    UNICOR (also known as Federal Prison Industries, Inc.)
    UNICOR Recycling Business Group

T16, T17, T18 Disassemblers (geographic specific)

> Does the article talk about the human labor involved in breaking apart electronics? Does the article discuss working conditions for recycling and disposing of electronics? If yes, then code based on location of the labor.

* Descriptions of pickers and people that work in industries around end-of-life electronics. These are laborers/workers who work in e-waste recycling plants, factories, sites, and processing areas. People who take apart, break down, dispose, and collect usable parts and materials for income and as employment.
    example: pickers, recyclers, workers
* Sites can be regulated and unregulated sites. This can mean people's homes, landfills/dumping areas, formal factories and street side workshops.

* Vivid descriptions of working or living conditions may also be used. Descriptions of process of pulling apart electronics with chemicals and tools, descriptions of the workers' and pickers' bodies, recreations of scenes with words that describe smells and sights.

* May include interviews or quotes (direct or indirect) with workers of picking sites, recycling centers, processing plants. Articles may include indirect quotes from workers who are not able to give names due various dynamics of working conditions.

T16, T17, T18 Disassemblers (Cont.)

Coding Decision
If quotes are from an owner or executive or spokesperson, then review coding decision for T5 and sourcing decisions for E-waste Industry (C).

If article describes artistic use of disassembler work or the disassembler is an artist, then code as T11 (Art/design projects).
If article discusses human labor involved in other aspects of electronics life cycle (like working conditions for mining of minerals or factory conditions in cell phone production, code as T19 (supply chains)

T16 Disassemblers: Global North, OCED countries

United States, Canada, Mexico, Europe/European Union, United Kingdom, Israel Australia, New Zealand, South Korea, Japan

T17 Disassemblers: Global South, non-OCED countries

* Phrases to watch for: developing countries, less developed countries, under developed, low income countries, global south, poor countries, poverty stricken countries
* whole continents may be referenced (Africa, Asia, South America).
* Likely to see: China, India, Ghana, Nigeria

T18 Disassemblers: no location specified

Use if working conditions of electronics disassembly are discussed but no location is mentioned.

T19 Supply chains/production/manufacturing

Does the article discuss issues surrounding the life cycle of electronics (not including end-of-life electronics disposal or e-waste)?

* Discusses processes and labor relating to production of electronics.
    examples: manufacturing; factories; mining for minerals involved in production; labor unions; worker problems in production factories (suicides, strikes, health issues); conflict minerals

* May discuss companies that build or make electronic products. May refer to supply chains and distribution of products.
    example: Foxconn factories that make Apple products. Apple is the brand, Foxconn is the manufacturer.

* Original Equipment Manufacturer (OEM)**:** the brand owner of products. These companies typically hold the patents for the products.
    examples: Acer, Amazon, Apple, Cisco, Dell, Google HP, IBM, Intel, Lenovo, Microsoft, Nokia, Samsung

* Original Design or component Manufacturer (ODM): company that physically manufacturers the products, typically a contracted firm. Components are parts of electronic devices like hard drives, disk drives, display panels, etc.
    examples: Asustek, Benchmark, Celestica, Compal, Elcoteq, Flextronics, Foxconn (Hon Hei), Jabil, Pegatron, Plexus, Quanta, Sanmina-SCI, Solectron

* May discuss human labor involved in manufacturing, production and designing electronic devices.
    examples: slave labor, trafficking for minerals/materials, miners, manufacturing workers, assemblers, engineers, chemists, technicians, programmers

* Materials (especially rare earth minerals) involved in electronics production. Issues of mining, economics of mineral supplies and trading, difficulties of extraction and mineral scarcity may be discussed.
    examples: copper, gold, neodymium, palladium, tantalum or coltan, tin

* Return-to-sender manufacturing and toxic flows: where the toxics are originally manufactured in one place, sent to another for consumption, and then sent back to manufacturing place for toxic disposal.

T20 E-waste amounts are growing, increasing

Does the article discuss the context, scope, or size of e-waste problems?

* Context: Article is setting up the context of the issue of e-waste; this way the reader does not have to know the previous information, the article is giving the reader information about this issue–how big a problem it is or will be.

example: There are this many computers in the world, and last year there were this many; maybe a discussion of a statistic about how many electronic devices are being thrown away.

Coding Decision: Article may be giving some information, but is it discussing as a changing issue or increasing problem? If article implies that the reader knows about the issue (that e-waste amounts are growing) but doesn't say explicitly, than code NO.

example: "describes e-waste as an enormous and pressing challenge." (J. M. Foster, 2011) [T20, NO]

Coding Decision: Metaphorical descriptions that may not specifically use numbers but still give information about the size and scope of the e-waste problem.

examples: "disposal of end-of-life assets has become a ticking time bomb", "a tsunami of used, obsolete PCs" (Margulius, 2004) [T20, YES]

"an environmentally sound way to handle the explosion of 'e-waste'" (DePalma, 2005) [T20, YES]

* Article use specific numbers and may include a change of time as a marker of growth. Discussion of numbers, amounts being disposed, types of disposal rates (either in trash, sent to recycling center, exported, reused).

examples: "over the next three years, 250 million computers are expected to be come obsolete" (Associated Press, 2005)

"In the U.S., electronic waste is a fast-growing source of waste. In 2007, about 18 percent of TVs and PCs were recycled, and about 10 percent of cell phones were, according to the EPA." (LaMonica, 2011)

T20 e-waste amounts are growing, increasing (Cont.)

Coding Decision: What is the difference between recycling rates and e-waste growth?

In the above example, the article states that electronic waste is "a fast-growing" waste stream. It gives rates of recycling, which if stated inversely show the rate of non-recycled PCs (almost 80% not recycled). So would code YES for T20. If the context of growth or scope of the problem is not discussed or referenced than code NO.

Articles may discuss recycling rates in the context of used electronics infrastructure [T5]. If recycling rates and types of items being recycled is discussed without context or connection to problems with e-waste, code [T5]. If rates are being discussed, quoted (indirectly or directly) from an electronics recycling sector source [Actor C] than this gives additional weight to coding as T5 (recycling sector) over T20 (e-waste growing).

If article is only discussing how many electronics will be purchased [T12, consumerism] without discussing end-of-life issues, would not be coded as T20. If article discusses upgrading (buying new devices) and estimates of recycling rates or selling of used electronics as part of the upgrade process, this could potentially be coded also at T20. But it must discuss the amounts of e-waste and/or used/old/dead electronic devices as growing or increasing.

T21 Harmful materials in electronics

Does the article discuss that electronics contain toxic materials? Are materials in electronics discussed in terms of being harmful or bad for humans and/or the environment? Are the potential health and/or environmental effects of chemicals contained in electronics discussed? Does the article discuss what types of toxic and harmful materials used in manufacturing processes for electronics?

Electronic products contain a variety of toxic heavy metals such as mercury, lead, and cadmium as well other likely carcinogens such as polyvinyl chloride (PVC) and trichloroethylene, and hexavalent chromium, and two brominated flame retardants (Grossman, 2007).

* Context or background information about the material components of consumer electronics. If the specific chemicals are mentioned, then this can be coded as T21.

batteries: phosphor residue/dust, mercury phosphor, lead, cadmium, mercury

circuit boards, printer drums, liquid crystal displays, flat screen glass, light emitting

diodes: hexavalent chromium, antimony, barium, lead, thallium, beryllium, arsenic, & selenium.

T21 Harmful materials in electronics (Cont.)

* General accounts of toxic and harmful materials (may not specify the exact chemicals)

example: "witch's brew of over a thousand chemicals, many of which are known or suspected carcinogens or reproductive toxins" (Byster & Smith, 2006, p. 205)

* Article discusses personal or private realms connect to the issues of harmful or toxic materials in electronics.

examples: Article could discuss research that examines household dust that has high amounts of brominated flame retardants or "toxic dust" partially attributed to electronic products.

* Article discusses toxic and harmful materials used in manufacturing of electronics.

example: Article discusses cancer rates in Samsung factory workers due to chemical exposure (Lee, 2015). This could also be coded as supply chains [T19].

* May discuss toxic materials in connection with problems of product design. If article is about designing with less plastic and states or discusses why this might be a good idea as it relates to health or environmental concerns, then could be coded as T3 AND T21, depending on if there is enough discussion of toxicity or health or environmental problems linked to materials in electronics.
Coding Decision: Article discusses materials in electronic products without discussing harm/toxicity concerns–this is coded as product design [T3].

example: Your phone is made up of plastic and tin. Does the article say those can be harmful? Does it locate these materials in terms like–plastic has PCBs and PCBs can cause cancer or other contextual health information? If no, then code NO for T21.

Coding Decision: What is the difference between T21 and T22?

* Article discusses the after effects (to the environment or health) of materials in electronics without specifically discussing the disposal phase.

example: Article says something about a chemical used in TVs that is known to leak into ground water and create poisonous groundwater. If the article does not say that the chemical is leaking into groundwater because the TV was not disposed of in a safe and responsible way, then code as T21–the article is just connecting that TV's have the chemical in them, but the article is not talking about disposal.

* If article discusses environmental or health problems related to end-of-life phase of electronics (e-waste, disposal, disassembly sites, etc.) in relation to toxics or harmful materials in electronics, then code as T22. If toxic or harmful materials discussed related to manufacturing and consumer use, then code as T21.

example: "leaving millions of poor people exposed to heavy metals, PCBs and other toxins" (Casey, 2008)

T21 Harmful materials in electronics (Cont.)

How are they exposed to it? Where is the exposure happening? Is in their water, their homes? A product of the working conditions of disposing? It's pretty vague. This article section later discusses that the toxic waste is partially (and increasingly) related to "televisions, cell phones…sent to poor nations for recycling." Because the article is not discussing the materials in the electronics but discussing the electronics as waste/toxic trash, it is coded as T22, not T21

.

* If article is discussing toxic or harmful materials in electronic products (in product design, manufacturing or consumer use) AND the article also discusses the end-of-life phase of electronic products AND makes the connection that the toxics in the product are a problem after the product is disposed of, then code as both T21, T22 (and T3 or T19 if appropriate).

T22 Electronic waste and/or disposal is hazardous and/or toxic

Does the article discuss e-waste as toxic or hazardous waste? Does the article discuss environmental and/or health impacts of electronics disposal?

* Article may include descriptions of the chemicals or hazardous processes used during material reclamation and disposal (disassembly, recycle, break apart or destroy electronics). Could discuss regulated and/or unregulated disposal and recycling sites. Descriptions may "vividly illustrate" (Edge, 2011, p. 158) the environmental or health hazards associated with toxics and e-waste disposal. *examples:*

cooking circuit boards=open flames used to melt lead from circuit boards
acid stripping=putting computer chips in acid baths

"visits to electronic waste processors in the United States reveal a very serious lack of concern and knowledge about the impacts of such hazards as brominated flame retardants and beryllium in fumes and dusts, as well as toxic cadmium and rare-earth, metal-laced phosphors release by broken cathode ray tubs (CRTs)" (Puckett, 2006, pp. 229–230)

* May discuss transnational legal and illegal exports, disposal or dumping of electronics; general toxic or hazardous waste flows and the policies surrounding disposal.

* May also discuss how electronic waste disposal relates to broader issues of how and where toxic waste is disposed of globally. Some discussions of policy and treaties may be seen.

T22 Electronic waste and/or disposal is hazardous and/or toxic (Cont.)

Coding Decision: If article is primarily focused on general toxic waste disposal flows and includes a discussion of electronics as a part of the toxic waste stream, use topic decision guidelines to determine if there is enough of a discussion about electronics waste to be coded as T22. Must be more than a few words in a list of possible sources of toxic waste.

* Material degradation issues. May discuss how chemicals and materials in electronics, while possibly not harmful in one form, become toxic or hazardous at the end-of-life phase. *examples:* chemical seepage in landfills, air pollution through incineration

* E-waste may be described as poisonous or hazardous waste, or other ways that imply toxic waste. May use other ways to describe waste, dumps or garbage, e.g. "toxic detritus."

* Article may discuss the health impacts on e-waste workers (see pg. 391). Could be coded as T16, 17, or 18 [disassemblers, location specific], AND coded as T22 [e-waste as toxic waste], if the work sites or work activities are discussed in terms of toxicity, contamination or health and/or environmental concerns.

* Article could discuss communities impacted by e-waste disposal sites and e-waste exports. This may include descriptions of children or other seemingly non-worker actors or "vulnerable populations" (Edge, 2011, p. 158). Could discuss environmental or health problems stemming from toxic sites connected to end-of-life electronics and disposal or disassembly of e-waste.

T23 Anthropocene/environmental crisis

Does the article discuss or connect problems with consumer electronics production, consumption or disposal to issues related to Anthropocene era environmental problems?

Anthropocene or "New Human" refers to the geological epoch that began after the Industrial Revolution and reflects the impact of humanity as "the main driver of rapid changes in the earth system" (J. B. Foster, Clark, & York, 2010, pp. 13–14). Anthropocene era environmental problems are seen as "planetary boundaries" related to three categories of environmental problems:

[have tipping points, or measurable changes in levels that "threaten to destabilize the planet"]
* climate (climate change, global warming)
* ocean acidification
* stratospheric ozone depletion (ozone layer)

["signify onset of irreversible environmental degradation"]
* nitrogen/phosphorus cycles

T23 Anthropocene/environmental crisis (cont.)

* freshwater use (includes groundwater pollution)
* changes in land use (like mining or mineral extraction)
* biodiversity loss and/or extinctions

[currently "not yet adequate physical measures"]

atmospheric aerosol loading
chemical pollution (J. B. Foster et al., 2010, p. 14)

example: Hayden said of this weekend's e-waste fundraiser, "I want to help the planet be green so polar bears don't become extinct" (Oremus, 2013)[if only had mentioned the planet being more green would not be coded as T23–too vague. But because mentions extinctions, counts as T23]

* Article could connects issues related to these categories of environmental problems by discussing levels and measurements connected with climate change or global warming problems. Things like fossil fuel consumption, greenhouse gas, and carbon emissions.

example: A discussion of product design connects using less electricity to carbon outputs and climate change. Coded as T3 (product design) AND T23 (Anthropocene context)

* An article discusses rare earth mineral extraction for supply chains of electronics manufacturing and damage to land and water supplies. Coded as T19 (supply chains) AND T23 (Anthropocene context).

* Could discuss the precautionary principle as relates to new technologies. The precautionary principle asserts that even in the absence of "full scientific certainty" (e.g. due to a lack of adequate measuring techniques), that something (like a chemical, material, process or **c**ombination of those things) harms the environment (human health included), the principle urges caution in using, releasing, or incorporating the thing into the environment (Byster & Smith, 2006, p. 212).

example: nanotechnology and disposal of products that contain nanotechnology.

Coding Decision: Articles coded as other topics could potentially also be coded as [T23] if connection to environmental problems is discussed more specifically than a mention. If the only discussion is about toxic waste and e-waste as toxic waste [T22], do not code as T23. There must be a discussion about environmental problems besides toxic waste to merit a [T23] code. References to groundwater contamination may be seen, but must be more than a mention of the words "groundwater contamination".

Sources/Actors — Instructions

Actors are persons, groups, institutions, or organizations. Actors can also be views or opinions attributed to these people and organizations. Quotes are all statements that are attributed directly or indirectly to an actor. For both sections of articles, identify actors and count all direct and indirect quotes for each actor category.

What counts as a quote?

* A counted quote includes: direct, indirect, and paraphrased quotes.

> Direct quote: "This is because ... ," Greenpeace said. (Actor A, Activist)
> Indirect quote: According to Secretary-General of the UN, Mr. Kofi Annan, the program will.... (Actor H, Transnational Orgs)
> Paraphrasing: Best Buy said that the policy would benefit the … (Actor B, Industry)
> Article title, subtitle or lede sentences: If a quote appears in these locations, code as a quote. If the quote is duplicated (or possibly expanded) later in the article, count again.

* Look for indicators of reported speech or verbs that indicate direct, indirect or paraphrased. See full list at the end of this section.

What are examples of indirect attribution that would not be counted?

* Indirect attribution does not include "I" statements in pieces that are written in 1st person, columns, or editorial articles.

* Indirect attribution does not include website links related to how to recycle sections of articles.

> Dell and HP also have partnerships with the National Cristina Foundation (www.cristina.org), which channels used equipment to people with disabilities and at-risk students.
>
> The Capital PC User Group accepts donations of old equipment at its downtown Rockville office. No fee applies; details are available at the group's Web site (www.cpcug.net/reboot.asp). (Musgrove, 2005)

How to identify and count actors?

* Count each quote by actor separately. So, if there are 2 quotes by the same Ebay person in the first five paragraphs, that would be coded as Actor B (industry), 2 quotes.

What if one quote (indirect or direct) reflects two actors?

> During that call, **Reps. Mike Thompson, a Democrat from St. Helena, and Gene Green, a Houston Democrat**, **said they hoped** the GAO report will spur Congress to enact stronger regulations on electronic waste. (Davies, 2008) [Actor E, 2]

Sources/Actors — Instructions (Cont.)

What if a quote by the same actor is broken up into multiple sentences in the same paragraph?

* If is one paragraph with one actor with more than one sentence and only direct quotes, with words in between for editing, then code as one quote. Watch for a comma separating the actor identification from the remaining of the quote.

> *direct quote example:* "Recycling became huge because of the electronics firms**,'' said** Chen Wei-Hsian, the secretary general of the Formosa Association of Resource Recycling, an industry organization. "That's why it's grown from about 100 recycling outfits to over 2,000." (Nunnis, 2013) [Actor C, 1 quote]

This counts as one quote for the actor because even though the paragraph has two sentences with direct quotes, both quotes are from the same statement, which was broken up for editing requirements.

> *indirect quote example:* **Kyle says** that between 50 and 80 percent of the e-waste that we send to recyclers is exported to developing countries. Federal intervention is necessary, **she says**, because individual states don't have the authority to establish the export restrictions that are needed to make sure that state e-waste recycling laws aren't subverted by abusive recycling companies. (Paul, 2011) [Actor A, 2 quotes]

This example counts as two quotes for the actor because the two sentences are separate grammatically.

What if an actor is quoting or referencing a statement from another actor?

* A press release or report that is quoted (indirect or direct) is coded to the actor that the press release or report is attributed to. For example, if a Best Buy press release is quoted, then the actor is Best Buy [Actor B, Industry].

* If a report is quoted that quotes other actors, use the source of the report.

> *Report example:* Microsoft, Nintendo and Sony have committed to making greener products. **According to the Greenpeace report,** Microsoft said it would stop using PVC and BFR in its hardware by 2010, Nintendo said it would eliminate PVC in its products but has not committed to a date, and Sony said it would phase out PVC and certain uses of BFR in its mobile products by 2010. (Pratt, 2008) [Actor A, 1 quote]

This paragraph is quoting the source, the Greenpeace report, which is saying that these companies said those things. Code as Actor A=1 because the article is quoting another source about a different source.

Sources/Actors — Instructions (Cont.)

If the quotes were from those actors then each of those actors would have a quote counted.

> *example*: In a statement, **Microsoft said** ___. **According to Greenpeace**, Nokia said this ___ but yesterday **Nokia's CEO said** this ___ in response. [Actor B=2, Actor A=1]

* If a report is attributed to a number of unspecified organizations, code as 1 quote for the type of organization.

> *example:* five environmental groups released a report that said "_____." [Actor A, Activist]

What about non-specific attributions, e.g. analysts or environmentalists?

* For non-specified, general labels of actors, use the codebook to determine which category it would fit in. Most of these will be fairly straightforward, like environmentalist.

> **Researchers** at Ashland **say** they have randomly tested plastic toys and found high lead levels, mostly in products that have not yet been recalled. (Article_12053) [Actor I, expert (university)]
>
> More fundamentally, **scientists say** heavy exposure to lead in the environment has serious health effects. (Barboza, 2007) [Actor I, expert (university)]
>
> **Several paint companies said** the government had no formal standard on lead in industrial paint. (Barboza, 2007) [Actor B, industry]

* If these non-specific attributions are found in Section 1 and then later clarified in section 2, then use the actor category from Section 2.

> Section 1: It's a move **analysts say**[1] could make the personal computer company a major player in the competitive printer market. [Actor I, expert (market)]
>
> Section 2: "**Meta Group analyst Steve Kleynhans said**[1] because…" (Mabin, 2003) [Actor I, expert (market)]

Explanation: 1. This actor attribution refers to the same analysts that the reporter names later in the story [Actor I, expert (market)].

Sources/Actors — Instructions (Cont.)

Examples of indirect attribution.

* One sentence with two different sources in indirect quotes.

> Evidence of a problem emerged weeks ago when fish began dying**, locals said[1],** and on Thursday police detained three top managers of a Zijin facility in the Fujian county of Shanghang, where the company is based**, the company said[2],** confirming a report in the state-run Xinhua news agency. (Areddy, 2010)
>
> *Explanation:* 1. Public, Actor J 2. Industry, Actor B

Examples of indirect attribution (continued).

* Possibly tricky indirect attribution.

> Of late, much of the activists' attention has been on Al Gore, Apple board-member and self-appointed global warming change agent. We're creeping up on Apple's annual meeting and Earth Day, and the heat is on again, this time from what is reputed to be a coalition of **"over 70 environmental, and consumer groups and other activists."[1]**
>
> **The joint statement[2] was put out today** by the Computer TakeBack Campaign, whom I spoke with last year. Interestingly, the **groups now claim[2]** that Gore agreed to lobby on their behalf last April but reneged on the deal at subsequent meetings. **They're looking[2]** for three things: One is for Apple to be the best computer company in terms of take-back and recycling, another is for Apple to phase out toxic materials. (Mortensen, 2007)
>
> *Explanation:*
> 1. The 1st paragraph uses a direct quote from the press statement, which isn't named explicitly until the next paragraph.
> 2. The 2nd paragraph in the example is talking about the past and present, but the "now claim".. section of the statement is referencing the press statement (present day) and is an indirect attribution to the advocacy groups' statement.

Sources/Actors — Instructions (Cont.)

Examples of indirect attribution. (Cont.)

* Possibly tricky indirect attribution. Paragraphs with two quotes by the same actor category.

> **Some manufacturers say**[1] they are moving away from lead alloy at the request of customers, especially those from the U.S. and Western Europe. **Nearly all say that**[2], if a buyer wants them to, factories can lower the lead content of their products. "People can choose. We give them whatever they want," **says Ni Lanzhen, a wholesaler of jewelry and trinkets**[3], including a tiny ring topped with a lead flower. "But most of the market is lead alloy."[3]
>
> **Some importers,** on the other hand, **complain**[4] insuring product quality from China can be difficult. Myles Marks, an employee of DM Merchandising in Elmhurst, Ill., says that his company stepped up testing after authorities discovered that some Chinese-made bracelets contained lead, which the company was unaware of. "There are items we've had to test and retest three and four times," **says Mr. Marks**[5], when they fail to meet lead standards. "It's a colossal pain. And it's certainly costly."[6] (Fairclough, 2007)[Actor B, 5]
>
> *Explanation:* Both paragraphs have two beginning sentences that use indirect attribution to a vague/non-specified actor (manufacturers). The last sentence has a direct quote from a named person, a manufacturer/wholesaler.
>
> 1. This is indirect attribution to manufacturers. This counts as one indirect quote for Actor B.
> 2. This is indirect attribution to manufacturers. This counts as one quote, Actor B.
> 3. This is a direct quote from the wholesaler, counts as one for Actor B. Second part of the quote broken up into separate sentence but is not counted separately.
> 4. Indirect quote that uses a verb of indication, "complain" from importers, Actor B.
> 5. This is a direct quote from the importer, counts as one for Actor B.
> 6. This is part of the previous quote so is not counted separately.

Coding Decision: **What about iFixit.com and iFixit.org quotes?**

As discussed earlier, iFixit is complicated because of the variety of roles the organization plays within e-waste issues (see pg. 367 of codebook). Primarily, iFixit is an Actor C type source, as it is a private company that makes money in the recycled electronics sector. For articles that are predominately about iFixit, either about the business/organization or founder, Kyle Wiens, code as Actor C.
However, code as Actor A (Activist/Advocacy) when iFixit is discussed as a non-profit, or advocating organization, sometimes referred to as iFixit.org

Sources/Actors — Instructions (Cont.)

Examples of indirect attribution. (Cont.)

Coding Decision: **Green Century Capital Management**

If a Green Century Capital Management actor is referred to as an environmental shareholder advocate, then code as Actor A. If same organization is not referred to as environmental shareholder advocate, then code as Industry, Actor B. In the following example, the organization is acting as an environmental advocate and part of the e-waste network so the quotes are coded as Actor A.

> *example*: Green Century Capital Management, the investment firm that raised questions at Apple's annual meeting**, praised**[1] the new recycling program. "We're very happy to see Apple take this step," Andrew Shalit, a *shareholder advocate* at **Green Century said**[2] **in a statement.** "As shareholders, we see it as a way to increase foot traffic in Apple Stores and increase iPod sales. As *environmentalists*, we know that it will reduce the amount of toxic waste in our landfills and help consumers understand that electronics manufacturers can and should take responsibility for e-waste." (Gilbert, 2005) [Actor A, 2 quotes]

Coding Decision: **Ebay**

Ebay could be associated with industry (Actor B) OR electronics recycling industry (Actor C). Use context of article to determine how Ebay is being discussed. If the article discusses Ebay's business selling new computers or its involvement in industry lobbying organizations or legislative debates, then code as Actor B.

If article is discussing Ebay's policies or business around used electronics and electronics re-selling, this would be coded as Actor C.

Coding Decision: **Goodwill and Habitat for Humanity**

If a non-profit organization is quoted in the context of recycling or collecting donated used electronics, then code as Actor C. For example, the Habitat for Humanity-Redemtech Project which collects and distributes used computer equipment to families getting new homes from Habitat for Humanity ("Corporate Santa Claus; Habitat for Humanity teams up with an IT asset recovery firm to get cast-off PCs to low-income families.," 2010). If the organization is discussing other topics or referred to in a different context, then would be coded as Actor J, non-profit/public.

Indicators of reported speech (Krestel, Bergler, & Witte, 2008, p. 4), or verbs that indicate direct, indirect or paraphrased attribution (Stovall, 2013).

according
accuse
acknowledge
add
admit
advise
agree
allege
announce
answer
argue
ask
assert
beg
believe
blame
boast
charge
cite
claim
command
comment
complain
concede
conclude
confirm
consider
contend
criticize
decide
declare
decline
deny
describe
disagree
disclose
discover
discuss
doubt
estimate
expect
explain
fear
feel
forbid
forget
guarantee
guess
hope
imagine
insist
instruct
invite.
know
learn
maintain
mention
note
observe
order
persuade
predict
prefer
promise
propose
realize
recall
recommend
remark
remember
repeat
reply
report
request
reveal
say
see
state
stress
suggest
suppose
swear
tell
testify
think
threaten
understand
urge
warn
wonder
worry
write

A. E-waste Activist Network/Environmental Advocacy

Environmental organization, environmentalist (person/activist). This includes generic references to advocates or activists for e-waste, environmental justice, or environmentalism (e.g. environmentalist).

Organizations:

Basel Action Network (BAN)

Californians Against Waste
Center for Environmental Health (CEH)
Center for Research on Multinational Corporations
Clean Production Action (CPA)
Clean Water Fund

Computer TakeBack Campaign (CTBC)
Earthworks
E-waste Network (EWN)
Electronics TakeBack Coalition (ETBC)
European Environmental Bureau (EEB)
Friends of the Earth USA (FOE)
GrassRoots Recycling Network (GRRN)
Green Century Capital Management (see pg. 386 for coding decision)
Greenpeace China, (GP-C)
Greenpeace India, (GP-I)
Greenpeace International (GP)
Inform, Inc.
Lower Eastside Ecology Center

Make IT Fair
National Electronics Product Stewardship Initiative
National Resources Defense Council (NRDC)

Regional Council of Rural Communities

Society for Conservation & Protection of Environment (SCOPE)
Society for Research and Initiatives for Sustainable Technologies and Institutions (SHRISTI)

Taiwan Environmental Action Network (TEAN)
Texas Campaign for the Environment (TCE)
Toxics Link India (TL)

Worldwatch Institute

B. Industry

Quotes from corporations and industrial organizations not specifically mentioned as e-waste actors. Industry focuses on life cycle phases of electronics manufacturing–so companies involved in making, producing, designing, and selling electronics are included, but companies that just focus on e-waste, electronics recycling, used electronics are not (these are Actor C).

***** original equipment manufacturer: the larger brand owner of products.
Acer, Amazon, Apple, Cisco, Dell, Google HP, IBM, Intel, Lenovo, Microsoft, Nokia, Samsung

***** original design or component manufacturer: company that physically manufacturers the products, typically contracted firm. Components are hard drives, disk drives, display panels, etc.
Asustek, Benchmark, Celestica, Compal, Elcoteq, Flextronics, Foxconn (Hon Hei), Jabil, Pegatron, Plexus, Quanta, Sanmina-SCI, Solectron

* Industry actors associated with the life cycle of electronics, like mining and extraction companies (e.g. Zijin Mining Group), and electronics retailers (e.g. Walmart, Target).
China Mining Association (CMA)

* Includes corporate infrastructure organizations (like lobbying associations). Press releases, reports, or white papers that are quoted from these companies or organizations are also coded as this actor category. Investment banks and venture capital firms are also included.
examples: Consumer Electronics Association/Conference, Silicon Valley Manufacturers Group, Electronics Industries Alliance (EIA)

* General industry and corporate social and environmental responsibility organizations, not explicitly focused on e-waste.
examples: Business and Environmentalists in an Alliance for Recycling (BEAR), Electronic Industry Citizenship Coalition, Gartner, Inc, Global e-Sustainability Initiative (GeSI) Supply Chain Working Group, Green Electronics Council, Green Press Initiative, SMART 2020 Report

* A spokesperson or quote from a company that is seemingly not connected to electronics (any point in lifecycle). May be quotes related in some way to sustainability issues.
example: *W Hotel* general manager speaking about recycling plastic bottles

* software companies, app developers

C. Electronics recycling industry / e-waste business (non laborers/workers)

Any company or organization that works in electronics recycling sector. This also includes organizations that collect electronics to be recycled (like Green ATM, Goodwill, Habitat for Humanity). Press statements, releases that are attributed to these organizations are also coded as this actor category. Could be company officials and spokespersons, plant managers, industry groups, electronics recycling trade associations or lobbying groups, information destruction companies.

Advanced Electronics Recycling
Amandi Services
Call2Recycle
Cal Micro Recycling
Citiraya Diversified Recycling
CollectiveGood International
Diversified Recycling
Earth 911
Earth Friendly Recycling
EBay (see coding decision, p 387)
e-Cycle
ER3 (Electronics Recycling 3 LLC)
Fair Trade Recycling
Good Point Recycling
Goodwill (see coding decision, pg. 37)
Green Citizen
Habitat for Humanity (see pg. 37)
iFixit.com (see coding decision, pg. 37)
Microsoft Authorized Refurbisher
Rechargeable Battery Recycling Corp.
Recycla
Renovo Data Services,
Sims Recycling Solutions
United Recycling
Universal Recycling Technologies,
Waste Management Recycle America

* Associations/Coalitions/Lobbying organizations. Also includes coalitions of corporations, governments, & advocates.

Canadian National Recycling Coalition
Coalition for American Electronics Recycling
Bureau of International Recycling (BIR)
Device Renewal Forum
Fair Trade Recycling/WR3A
Green Electronics Council
International Association of Electronic Recyclers (IAER)
Institute for Scrap Recycling Industries (ISRI)
National Association for Information Destruction
National Center for Electronics Recycling
National Electronics Product Stewardship Initiative (NEPSI)
National Recycling Coalition (NRC)
National Waste & Recycling Association (NWRA)
Resource Recycling
United Network Equipment Dealers Association (UNEDA)

Coding Decision: If quote is from a e-waste worker/disassembler/picker/factory worker, then code as Worker (Actor, Variable D).

D. E-waste Workers/Disassemblers

Laborers/actors who work in e-waste recycling plants, factories, sites, e-waste processing areas. They could be described as pickers, recyclers, workers. See pg. 372-373 [T16-18] for more descriptions.

Harit Recyclers Association (India)

Coding Decision: If title of person indicates an owner or executive of an e-waste business, then code as Actor C.

E. United States: Federal Government

Any United States Federal government agency.

examples:

Congressional Research Service to E (part of the Library of Congress)
Consumer Product Safety Commission (CPSC)
Environmental Protection Agency (EPA)
Federal Prison Industries, Inc.; UNICOR
Government documents and forms (i.e. disclosure forms for lobbying expenses)
US Government Accountability Office (GAO)
National Electronics Product Stewardship Initiative (NEPSI),
U.S. federal elected official (congress, president)
U.S. Congressional Committee (example: Senate Environment and Public Works)

F. United States: State/Local Government

State, county, city government agency [Governmental: state/local, United States]

examples:
State Recycling Czar, Dept. of Toxic Substances Control, County Supervisor, City Manager, National Conference of State Legislators (NCSL), Washington Materials Management & Financing Authority

G. Government–Non-US, national/local

Representatives, spokespeople, elected officials from governments not from the United States.
example: Nigeria's Minister of the Environment or a representative from Environment Canada (Dept. of the Environment).

H. Transnational governance institutions

Representatives, spokespeople, or elected officials from transnational governance organizations and institutions that work with two or more nations in policy issues.

examples:
European Union
General Agreement on Tariffs and Trade (GATT),

International Telecommunication Union (ITU)
Organization for Economic Co-operation and Development (OECD)

StEP Secretariat
United Nations
United Nations Conference on Environment and Development (UNCED)
United Nations Environment Programme (UNEP)

World Trade Organization (WTO)

I. University or non-specified expert:

* An organization identification will usually be attached to the actor. Exceptions to this: authors of books about e-waste issues. These authors are also coded as this category.

* Experts or authors: experts or scientists (e.g. at a hospital, research institution or university) contacted by the reporter specifically for background or technical information, or an author on the subject referred to in the article.

* Authors of books about e-waste issues: Unless attached to an organization then code for the organization (i.e. a quote from the author of an article published by the Silicon Valley Toxics Coalition would be coded as A, activist)

example: Giles Slade, author of "Made to Break: Technology and Obsolescence in America," a journalistic and historical account of technology and obsolescence (Slade, 2006).

* News Outlets: journalist account/report that is cited in another article. Reporters from San Jose Mercury News, Frontline, 60 Minutes, CBC, Al Jazeera. These outlets covered e-waste issues and had their investigations covered by other news outlets.

example: A 60 Minutes report on e-waste that is quoted in an article.

I. University or non-specified expert: (Cont.)

* Academics: this includes scientists, economists, university research projects. University or research institution will be included with persons identification, or sometimes the person's name will not be used and just a reference to the institution is included.

example: University of British Columbia (UBC) did a project on e-waste that received a good amount of coverage. Persons connected to the project would be coded in this category. Artists/art projects that are attached to university institutions are also included.

Types of experts and examples:

academic: The Wright Institute, United Nations University, Institute of Electrical and Electronics Engineers

market: ABI Research, Forrester, Gartner, Navient (formerly Pike) Research, Saugatuck Research, Calvert Analysts, IDC, American Technology Research > Broadpoint > Gleacher & Co, Ipsos Mori

journalistic: James Kendrick, Xinhua news agency, Grist

witness: in the context of Fed Hearings, etc are coded as experts or whatever appropriate category they represent. if just says witnesses–code as I

J. Public

* The public includes references to citizens, residents, neighbors. Those not connected with the story as a representative of one of the other sources. Also includes the public, public opinion (also: "we," "one").

* Non-Governmental Organization (NGO) not specified as e-waste activism or environmental activism: This can be either a US or International NGOs. If a NGO or nonprofit group is not listed under Variable A, then code in this category, J (public sector).

examples:

National Safety Council
Council of State Governments
Product Stewardship Institute

J. Public: (Cont.)

* Artists who are not attached to specific/named institutions. Artist or gallery statements.

* Small business owners (often identified as a “small business”)

* workers: non e-waste workers or disassemblers.

example: In an article that discusses environmental pollution from Foxconn manufacturing includes lots of quotes from the general public and workers. All workers coded as Actor J because they are not specifically e-waste workers (Actor D). (Mozur, 2013)

K. Other–list actor title/name

Use sparingly and only when you cannot categorize an actor using the above categories.

Devices — Instructions

Devices are electronic devices involved in disposal, recycling, end-of-life, and e-waste issues. If devices are discussed not in relation to e-waste issues, then do not code.

Look for specific devices, not generalized mentions of "electronics".

Coding for device mentions throughout article, regardless of location. Mentions, not counts. So once a device category is seen, no further coding for that category is needed.

Coding for this can be done at any point in the process (so if during Section 1 a device mention is seen, then you can note that on the coding sheet). The other category should not be used too often. If you see a device mention that does not fit in the device categories, then code as other and write the device name.

Coding Decision: Batteries is listed as an example of other. If batteries are discussed in connection with a specific device, code the batteries with that device.

examples: Cell phone batteries are mentioned. Code as D3 (telephones, etc).
Batteries, non specified, are mentioned. These could be car batteries, AA batteries, battery packs for computers, etc. If it's unclear what type of batteries, then code as other.

Coding Decision: Devices are discussed in relationship to product design, consumption or mineral extraction issues. These issues are related to e-waste and thus devices are coded for those issues.

D1 Computers and accessories

Computers (desktop, servers)
computer accessories (input devices, webcams, speakers, data storage devices, servers, monitors, mouse, external hard drives/storage, keyboards)
Central processing units (CPU), circuit boards
mobile computers (notebooks, netbooks, tablets, e-book readers)
monitors: CRT, LCD, Screens
networking devices (routers, network cards, modems, hubs, cables)

D2 Television and Peripherals

televisions (flat screen, 3D, LCD, Plasma, CRT/Tube,
televisions portable (portable tvs and portable dvds)
tv peripheral (VCRs, DVD/DVD-R players, signal converter boxes, and cable and satellite receivers
video products (DVD/DVD-R players, laser discs)

D3 Telephones and electronic communication equipment:

cellular phones: mobile, smart phone, i-Phone, Android (numerous brands make this type of phone, example Samsung, Motorola, Nokia), Blackberry, Windows phone

electronic communication equipment: pager, personal digital assistant, wearable health monitoring device. GPS devices, portable music players (iPod, MP3 player), headphones, bluetooth ear pieces

D4 Audio/Video/Imaging

digital imaging devices (printers, copiers, facsimile machines, image scanners, multifunction machines)
digital cameras and projectors
digital audio players
audio equipment
video display devices (digital picture frames and portable video devices)

D5 Video games

consoles, game cartridges/disks, controllers (plastic guitar for guitar hero, nunchucks for Wii,etc; handheld/portable controllers and portable video game systems (Nintendo 3DS, Sony PSP, Gameboy)

D6 Appliances

home appliances like refrigerators, washing machines, microwaves, coffee makers, ovens

D7 Other

Specify _____ Write the name of the item on the coding sheet.

Other should be used for references to disposal of non-electronic device items that have been included in discussions of toxics. *examples*: batteries, solar panels or solar technology, ships, pesticides (a general mention is OK).

Use sparingly and only when you cannot categorize a device using the above categories.

Do not use other for general mentions of “hazardous” or “toxic waste”. It must say what items are becoming the waste.

Article Type — Instructions

A1. Is the article an editorial, opinion piece, or column?

Includes articles that are listed as editorial, opinion, or advice columns. Some articles will have this information listed as their section name (in Lexis Nexis). Focus more on self-reporting of editorials/columns, opinions. Some articles may list the editorial board as the author–this would indicate an editorial article.

* If article mentions that author writes columns, code as YES. Example of self-reporting column is, at the very end of article, "More columns from Lance Ulanoff:" (Ulanoff, 2003). This means that this article is one of the columns by the same author, so it's a column, code as "yes".

Coding Decision: Some articles (LexisNexis articles) will include column information. This does not mean automatically mean the article is a column–it describes the article location in the printed paper. Example: SECTION: Section C; Column 4; Business/Financial Desk; Pg. 6 (Coded as "No")

* Self-reporting: The author is listed as the editorial board or Opinion is listed as the section. *example:* New York Times Editorial Board; Section name–Tech, Opinions.

* If author identification isa company or organization with an interest in the issue. Example: Redemtech staff person listed as author byline. (Houghton, 2006)

* If the text of the article clearly states something about the author's opinion of the issue, example "In my opinion" "In Gizmodo's opinion" then code as "yes".

Coding Decision: For articles that are written in casual or familiar writing (esp. articles from the gadget media), do not automatically code as editorial or opinion. Article must explicitly state somewhere that it describes itself as or is categorized as opinion or editorialized content.

A2. Does the article include a how-to-section?

The article may highlight or focus on organizations that recycle e-waste, either through recommendations for dealing with e-waste, where to donate, an FAQ, or a list of local drop-off locations. This could be a list of where to recycle electronic devices, a question & answer section (or full article) that answers questions about electronic waste issues or a Frequently Asked Questions (FAQ) about e-waste section.

example: Article title "Q&A: Recycling E-Waste By the Book"

A2. How to articles: (Cont.)

* How-to information does not need to be separate component of article: it could be embedded in the article content. If the article includes links to organizations as part of content in a paragraph that is directing readers where or how to recycle electronics, then code as YES.

Coding Decision: If article is discussing places to recycling, etc, could this also count as a topic, like T5 (recycling industry) or T6 (activism)? Yes, code the topics separately from the Article Type. After you have coded Topics, go back and see if Article Type features are found.

Coding Decision: Some articles (AP articles most likely) may have an "On the Net" section at end of article that contains links to organizations mentioned in the article. This is not a How-To-Section example and should be coded as "No".

A3. Is the article exclusively about a local e-waste disposal event?

Exclusively means that there is no other content in the article, no quotes or sources, no other information other than an event listing.

Article could be formatted as how-to content and could also be exclusively about an e-waste event.

A4. Are there graphical/multimedia elements in the article?

Code for presence of graphical or multimedia elements. This information could be found at the end of the article (LexisNexis). A reference to a multimedia element may be found in the article text. Multimedia elements could be videos, documents, photos, slideshows, audio files.

Graphics and or multimedia elements category does not include links embedded in the article or the "On the Net" section included in some AP articles.

Coding Decision: If the only graphic listed in the article is a logo for the section, column or blog name that the article was located in, code as "No".

example: **"GRAPHIC:** AP Graphic TECHBITS LOGO" (Bergstein, 2002)
This is a graphic for the section that the story ran under. In this case, the Associated Press's TechBits section.

#FIN

APPENDIX C

PRINCIPLES OF ENVIRONMENTAL JUSTICE

Principles of Environmental Justice

Delegates to the First National People of Color Environmental Leadership Summit held on October 24-27, 1991, in Washington DC, drafted and adopted 17 principles of Environmental Justice. Since then, The Principles have served as a defining document for the growing grassroots movement for environmental justice.

PREAMBLE

WE, THE PEOPLE OF COLOR, gathered together at this multinational People of Color Environmental Leadership Summit, to begin to build a national and international movement of all peoples of color to fight the destruction and taking of our lands and communities, do hereby re-establish our spiritual interdependence to the sacredness of our Mother Earth; to respect and celebrate each of our cultures, languages and beliefs about the natural world and our roles in healing ourselves; to ensure environmental justice; to promote economic alternatives which would contribute to the development of environmentally safe livelihoods; and, to secure our political, economic and cultural liberation that has been denied for over 500 years of colonization and oppression, resulting in the poisoning of our communities and land and the genocide of our peoples, do affirm and adopt these Principles of Environmental Justice:

1) Environmental Justice affirms the sacredness of Mother Earth, ecological unity and the interdependence of all species, and the right to be free from ecological destruction.

2) Environmental Justice demands that public policy be based on mutual respect and justice for all peoples, free from any form of discrimination or bias.

3) Environmental Justice mandates the right to ethical, balanced and responsible uses of land and renewable resources in the interest of a sustainable planet for humans and other living things.

4) Environmental Justice calls for universal protection from nuclear testing, extraction, production and disposal of toxic/hazardous wastes and poisons and nuclear testing that threaten the fundamental right to clean air, land, water, and food.

5) Environmental Justice affirms the fundamental right to political, economic, cultural and environmental self-determination of all peoples.

6) Environmental Justice demands the cessation of the production of all toxins, hazardous wastes, and radioactive materials, and that all past and current producers be held strictly accountable to the people for detoxification and the containment at the point of production.

7) Environmental Justice demands the right to participate as equal partners at every level of decision-making, including needs assessment, planning, implementation, enforcement and evaluation.

8) Environmental Justice affirms the right of all workers to a safe and healthy work environment without being forced to choose between an unsafe livelihood and unemployment. It also affirms the right of those who work at home to be free from environmental hazards.

9) Environmental Justice protects the right of victims of environmental injustice to receive full compensation and reparations for damages as well as quality health care.

10) Environmental Justice considers governmental acts of environmental injustice a violation of international law, the Universal Declaration On Human Rights, and the United Nations Convention on Genocide.

11) Environmental Justice must recognize a special legal and natural relationship of Native Peoples to the U.S. government through treaties, agreements, compacts, and covenants affirming sovereignty and self-determination.

12) Environmental Justice affirms the need for urban and rural ecological policies to clean up and rebuild our cities and rural areas in balance with nature, honoring the cultural integrity of all our communities, and provided fair access for all to the full range of resources.

13) Environmental Justice calls for the strict enforcement of principles of informed consent, and a halt to the testing of experimental reproductive and medical procedures and vaccinations on people of color.

14) Environmental Justice opposes the destructive operations of multi-national corporations.

15) Environmental Justice opposes military occupation, repression and exploitation of lands, peoples and cultures, and other life forms.

16) Environmental Justice calls for the education of present and future generations which emphasizes social and environmental issues, based on our experience and an appreciation of our diverse cultural perspectives.

17) Environmental Justice requires that we, as individuals, make personal and consumer choices to consume as little of Mother Earth's resources and to produce as little waste as possible; and make the conscious decision to challenge and reprioritize our lifestyles to ensure the health of the natural world for present and future generations.

The Proceedings to the First National People of Color Environmental Leadership Summit are available from the United Church of Christ Commission for Racial Justice, 475 Riverside Dr. Suite 1950, New York, NY 10115.

Document source: The principles of environmental justice (EJ). (1991).
Retrieved from http://www.ejnet.org/ej/principles.html

APPENDIX D

LIST OF ACRONYMS AND ABBREVIATIONS

Acronym	**Name**
ARF	Advanced Recycling Fee
AVN	Adult Video News
BAN	Basel Action Network
BFRs	Brominated flame retardants
CAER	Coalition for American Electronics Recycling
CAW	Californians Against Waste
CE	Consumer Electronics
CEA	Consumer Electronics Association
CEH	Center for Environmental Health
CES	Consumer Electronics Show
CPA	Clean Production Action
CPEC	Critical political economy of communications
CSR	Corporate Social Responsibility
CTA	Consumer Technology Association
CTBC	Computer TakeBack Campaign
CTIA	The Wireless Association (CTIA Wireless Foundation)
DIY	Do it yourself
EIA	Electronic Industries Association
EICC	Electronic Industry Citizenship Coalition
EMCRR	Electronic Manufacturers' Coalition for Responsible Recycling
EPA	Environmental Protection Agency
EPEAT	Electronic Product Environmental Assessment Tool
EPR	Extended Producer Responsibility
ETBC	Electronics TakeBack Coalition
FLOSS	Free libre open source software
GAO	U.S. Government Accountability Office
GeSI	Global eSustainability Initiative
HP	Hewlett-Packard Company
IAER	International Association of Electronics Recyclers
ICT	Information Communication Technologies
ICT4D	Information and Communication Technology for Development
ISRI	Institute of Scrap Recycling Industries, Inc.
ITI	Information Technology Industry Council
ITU	International Telecommunications Union
JEDEC	JEDEC Solid State Technology Association
KAB	Keep America Beautiful

MAR	Microsoft Authorized Refurbisher
MDG	Millennium Development Goals
MOMA	Museum of Modern Art
NCER	National Center for Electronics Recycling
NEPSI	National Electronics Products Stewardship Initiative
NGO	Non-governmental Organization
NIWCO	New World Information and Communication Order
OECD	Organisation for Economic Co-operation and Development
OEM	original equipment manufacturers
PBDEs	Polybrominated diphenyl ethers
PC	Personal computer
PCBs	polychlorinated biphenyls
PVC	Polyvinyl chloride
R2	Responsible Recycling
RCRA	Resource Conservation and Recovery Act
REACH	Registration, Evaluation, Authorisation and Restriction of Chemicals
RIOS	Recycling Industry Operating Standard
RoHs	Restriction of Hazardous Substances
SACOM	Students and Scholars Against Corporate Misbehavior
SDG	Sustainable Development Goals
SEZs	Special Economic Zones
SVTC	Silicon Valley Toxics Coalition
TCC	Transnational Capitalist Class
TCE	Texas Campaign for the Environment
TIA	Telecommunications Industry Association
TNCs	transnational corporations
UN	United Nations
UNEP	United Nations Environment Programme
VR	Virtual reality
WEEE	Waste Electrical and Electronic Equipment
WHO	World Health Organization
WSIS	World Summit on the Information Society

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