

# Table of Contents

Environmentalism for the Net 2.0 . . . . . 1



# Environmentalism for the Net 2.0

By Soenke Zehle

Happy to describe media cultures in ecological terms, net users may be unaware of the heavy ecological cost of communications networks. But can environmental justice and labour movements learn a trick or two from net culture? Soenke Zehle reviews two recent books, *High Tech Trash: Digital Devices, Hidden Toxics, and Human Health* and *Challenging the Chip: Labor Rights and Environmental Justice in the Global Electronics Industry*

The electronics industry, one of the largest manufacturing sectors of the global economy, is increasingly characterised by network-based models of industrial organisation. Following the corporate vision of systemic outsourcing, the industry has been a key driver in the general shift from vertically-integrated, multi-national corporations to 'global flagship networks' that integrate dispersed supply, knowledge, and customer bases. The complexity of global production networks and their shifting supply chains is not unique to the electronics industry. Yet compared to the wave of no-sweat activism across the garment industry, electronics manufacturing has seen comparatively few campaigns based on the principle of holding brand companies accountable for the conduct and compliance of their contractors. Two new books, one by an environmental journalist and one by a group of activists and researchers, might change that. They survey both the impact the electronics industry has already had on communities and workers in the old and new centres of electronics production, and the campaigns for economic and environmental justice that are attempting to transform the way this industry operates.

*High Tech Trash: Digital Devices, Hidden Toxics, and Human Health* by Elizabeth Grossmann is the most recent attempt to turn the dreadful stories of high-tech pollution, not unheard of but perhaps too scattered across research reports and academic anthologies to reach a general audience, into a captivating narrative. Grossmann includes chapters on raw materials, the environmental and human health impacts of electronics manufacturing, e-waste exports and recycling, and a conclusion that calls for a new land ethic.

[IMAGE]

Since Grossmann is trying to expand our sense of what it means to consider the economic and environmental impact of this industry, she begins with a sobering account of mining to stress how fundamentally new and old economies are intertwined. Describing the role each raw material plays in electronics manufacturing, she moves from her visit to a gigantic open-pit copper mine in the US to a discussion of the international trade in Coltan mined in the war-torn Democratic Republic of Congo, covering gold, zinc, and a host of other materials along the way. The chapter on high-tech manufacturing explains the chemical- and water-intensive production of chips etched out of silicon wafers and details the controversies that arise between scientists and manufacturing associations when it comes to conducting life-cycle analyses to measure the ecological impact of these very chips. The human-health chapter explores the legacy of pollution in electronics manufacturing communities across the US, recounts some of the uphill battles fought by workers exposed to chemicals in so-called 'clean rooms' of semiconductor fabrication, and discusses the rise of grassroots organisations like the Santa Clara Center for Occupational Safety and Health (SCCOSH) and the Silicon Valley Toxics Coalition (SVTC), now among the most important international clearinghouses in this area of economic and environmental justice. The chapter on flame retardants is perhaps the most difficult read, but it also provides a sobering reminder of how difficult it is to remove a single chemical compound from the manufacturing process or even just limit its use in response to new evidence regarding its toxicity.

The second half of the book surveys the implications of a growing e-waste stream so toxic that established disposal and recycling systems are ill-equipped to handle it, and focuses on the politics of recycling and the ongoing illegal export of electronic waste to Africa and Asia. Despite international agreements limiting the trade in hazardous wastes, a large amount of e-waste still ends up in dumps across the globe, a practice documented by environmental organisations like the Basel Action Network or Greenpeace International. The chapter on the politics of recycling includes a discussion of how the continued use of prison labour – electronics recycling being the fastest growing business of the US Federal Prison Industries (UNICOR) – effectively prevents the consolidation of a competitive local recycling industry in the US. Because Grossmann wants US state and/or federal governments to adopt EU-style legislation to regulate the production and disposal of electronics, she also discusses in some detail EU directives on Waste Electrical and Electronic Equipment (WEEE) and the Restriction of the Use of Certain Hazardous Substances in Electrical and Electronic Equipment (RoHS) currently being implemented across Europe. While WEEE and RoHS allow for numerous exemptions and have failed to meet the expectations of activists, the directives are nevertheless considered landmark legislation that has influenced similar efforts in Japan and China.[1]

Trying to bring all of this together is not easy, so Grossmann concludes by calling for a new 'land ethic for the digital age' to convince her readers to rethink their collective commitment to seeking out convenience, speed, and the next new thing. With its emphasis on US debates and initiatives (the appendix includes a short how-to-recycle guide) and its self-positioning in the canon of key US environmentalist texts (Rachel Carson's *Silent Spring* and Aldo Leopold's *A Sand County Almanac*), the book may be less relevant to readers outside the US. Which is why, even though Grossmann seems skeptical about the possible impact of quasi-academic anthologies, there is one that I would like to promote here as a companion volume. It's called *Challenging the Chip: Labor Rights and Environmental Justice in the Global Electronics Industry* and is edited by veteran e-activist Ted Smith (of the Silicon Valley Toxics Coalition), David Sonnenfeld and David Naguib Pellow, both seasoned analysts of environmental justice issues.[2]

[IMAGE]

Grossman wrote her book because she couldn't find a non-academic title dealing with the environmental implications of globalised electronics manufacturing and disposal.[3] But there is a brand of activist research texts that are neither general audience nor conventionally academic, and this is one of them. *Challenging the Chip* introduces the transformation processes already taking place across this industry, not only in greater detail than Grossmann, but also from the perspectives of the activists and researchers involved, with a corresponding emphasis on a sharing of experiences and strategies. In 25 chapters organised into sections on the state of the global electronics industry, on labour rights and environmental justice, and on e-waste and extended producer responsibility, the authors want to 'provide a vision of what a sustainable electronics industry can look like', linking environmental justice, the precautionary principle, and extended producer responsibility in a 'triad of sustainability'. And improvements notwithstanding, it becomes apparent that the electronics industry has yet to live up to the 'electronics sustainability commitment', a pledge demanding that '[e]ach new generation of technical improvements in electronic products should include parallel and proportional improvements in environmental, health and safety, as well as social justice attributes' – as our electronic gadgets become faster, their eco-social footprints should also become smaller.

The section on the global electronics industry opens with a discussion of 'networks of mass production in the new economy' by Boy Luethje, a sociologist and analyst of contract manufacturing as well as social movement unionism. Luethje concludes his detailed survey of how the contemporary structure of the electronics industry is becoming both more centralised and more fragmented at the same time by suggesting that the backbone for greater ecological and social control of the industry can only be

provided by viable workers' movements in the centres of electronics production. Joseph LaDou, Director of the International Center for Occupational Medicine, summarises recent medical research on environmental and occupational health across the electronics industry, noting that, largely as a result of industry resistance, the definitive study on cancer and reproductive hazards in the semiconductor industry has yet to be conducted. This is all the more important as many of the workers in electronics assembly are young women. Anibel Ferus-Comelo has contributed research on their experiences and of the violation of their basic worker's rights. Other chapters in the first section offer national studies of the electronics industries in China (Apo Leong and Sanjiv Pandita), Thailand (Tira Foran and David A. Sonnenfeld), India (Sanjiv Pandita), and Central and Eastern Europe (Andrew Watterson).

The section on environmental justice and labour rights affirms the need to address the much lamented separation of these fields of struggle, and introduces the network approaches of the Silicon Valley Toxics Coalition (Leslie Byster and Ted Smith) and the Santa Clara Center for Occupational Health and Safety (Amanda Hawes and David N. Pellow) that have had some success in bringing community, environmental, and worker organisations together. In an attempt to broaden the historical horizons of contemporary organising campaigns, David N. Pellow and Amelia Simpson give an account of the 'foremothers' of contemporary electronics activists – the immigrant cannery workers in the Bay Area. A series of case studies introduce similar efforts from across the globe, including Scotland (James McCourt), Mexico (Connie García and Amelia Simpson, Raquel E. Partida Rocha), and Taiwan (Shenglin Chan, Hua-Mei Chiu, and Wen-Ling Tu, Yu-Ling Ku). The section concludes with 'Unionizing Electronics: The Need for New Strategies' by Robert Steiert, Director of the Electronics Sector at the International Metalworkers' Federation (IMF). Steiert urges unions to intensify cooperation with NGOs and international agencies sympathetic to their agenda, and explores the use of International Framework Agreements (IFAs) to establish core labour standards that create an environment in which workers may organise without fear of reprisal.

The section on e-waste and extended producer responsibility begins with an overview of the electronics production life cycle (Leslie Byster and Ted Smith), followed by a survey of high-tech pollution in Japan (Fumikazu Yoshida), an account of the export of international e-waste (Jim Puckett), and of informal e-waste processing in Delhi (Ravi Agarwal and Kishore Wankhade). Several chapters directly address the emerging framework of extended producer responsibility (EPR), including overviews of EPR-activism in the US (Chad Raphael and Ted Smith) and of the international impact of new EU regulation (Ken Geiser and Joel Tickner), and a case study that assesses the extent to which EPR legislation has already transformed the industry in Sweden and Japan (Naoko Tojo). The final chapter discusses the Computer TakeBack Campaign, which successfully held Dell responsible for the conduct of its recyclers (David Wood and Robin Schneider).

[IMAGE]

What is perhaps important to readers already familiar with some of the most visible non-governmental players in this area, is the introduction of a large number of Asian organisations active in this field, including the Asia Monitor Resource Centre, China Labour Watch, Toxics Link, and the Taiwanese Environmental Action Network, as well as smaller environmental justice groups in the US like the South-West Organizing Project, the South-West Network for Environmental and Economic Justice, and the People Organized in Defense of Earth and Her Resources.

Environmental justice groups have often been criticised for their so-called 'NIMBY' (not in my back yard) attitude, a localism seemingly unconcerned with what happens when polluters leave their community to set up shop elsewhere. Yet these organisations are well networked, and often both more flexible and more effective in reaching out across borders than established environmental groups or

labour unions only slowly coming to terms with network models of organisation. These activists have also intervened in EU policy fora on behalf of new directives so adamantly opposed by US industry associations, and their network models include the International Campaign for Responsible Technology initiated by the SVTC and the European Work Hazards Network, a key area of organisation as occupational health and safety has been one of the areas in which the labour/environmentalism conflict, often assumed to discourage cross-sectoral mobilisation, has played much less of a role.

These two titles are not simply about the electronics industries, but about the widening scope of economic and environmental justice and creative grassroots responses to the global spread of the Silicon Valley experience. Supported by visions of technological transcendence, the electronics industry has effectively distracted public attention from the environmental and health implications of its products. Yet driven by grassroots organisations like SCCOSH the SVTC, it was Silicon Valley where the mythology of electronics manufacturing as a clean industry was first unmade. Sharing these histories, and the way they have resonated in centers of electronics manufacturing across the globe, can contribute to the a transformation of the way the electronics industry operates.

While different in their approach, these books are also attempts to frame and integrate a host of seemingly separate issues, including the impact of free trade agreements on disclosure and right-to-know legislation, questions of how to support the organisation of migrant workers, the need to pursue scientific research which could facilitate workers' claims against their employers and drive better regulation, the role certification schemes can play in facilitating local action, the need to exchange data, experiences, and strategies across movement networks, the impact of international trade agreements in limiting these instruments (e.g. when environmental purchasing agreements turn from community empowerment into violation of free trade) etc. And whether it's Grossmann's travelogue or the effort of Ted Smith and his colleagues to move beyond a news-from-the-grassroots narrative to consider alternative frameworks like ecological economics, both illustrate that simply sharing stories about what is going on in a globalised electronics industry will not result in broadening the dynamic of economic and environmental justice efforts beyond the modest number of activists that are directly involved in these campaigns. While the amount of technical detail makes these books less of a page turner than their authors may have hoped, it also illustrates that the kind of narrative best suited to map this dynamic and galvanise corresponding activist efforts is far from obvious.

Almost a decade ago, James Boyle called for a 'politics of the public domain' and suggested reinventing 'the commons' as a shared point of reference to bring about a convergence of info-political initiatives comparable to the way the novel notion of 'the environment' had succeeded in consolidating ecopolitical efforts in the 1960s.[4] Since then, the politics around the digital commons have arguably become the most vibrant and visible dynamic of net.cultural mobilisation. Perhaps the time has come to revisit the metaphor of an 'environmentalism for the net' to talk not only about multiple forms of resistance to an ever expanding intellectual property regime, but quite literally of the ecopolitical implications of the very infrastructures that facilitate and sustain the net.cultural dynamic of collaborative creation. Such an environmentalism, articulated conceptually and organisationally in the challenging context of electronics manufacturing's 'global flagship networks', could significantly broaden existing efforts by labour unions and NGOs to develop a broader agenda of economic and environmental justice. If nothing else, it could expand the number of narratives available to explore these concerns, stress their interdependence, and link them to existing info-political initiatives.

Such an approach would also call for an engagement with some of the ways in which the conceptual idioms of network culture may limit such encounters, to re-examine their reach as perspectives on social transformation, and encourage linkages with other, complementary idioms. It is surprising, for example, that references to the 'open media ecologies' sustained by new forms of commons based

peer-production have remained largely separate from a new politics of economic and environmental justice responding to the global spread of the Silicon Valley experience. There are good reasons for that, perhaps, among them the attempt by commons theorists to reappropriate an idiom tainted by its association with the 'tragedy of the commons' that was long considered inevitable, until researchers reasserted the viability of the commons as an effective system of resource management.[5] The affirmation of the 'immateriality' of the digital, anti-rival commons may come at the price, however, of also separating it from the toxic materiality of the resource dynamic that makes it possible in the first place. By extension, maybe we should not only question Cisco's politics whenever they work with repressive regimes to control internet traffic, but also when their contract manufacturers refuse to respect basic worker's rights or simply pull out of a community without taking responsibility for cleaning up after themselves. Or take F/OSS, which can do much to delay the impact of the rising wave of e-waste by promoting reuse and slowing down the substitution of one generation of computers with the next. But in the end, a PC produced in what is no more than a high-tech sweatshop is not changed fundamentally by installing a non-proprietary operating system. One could probably write a whole manifesto that spelled out possible encounters, alas, the times of manifestoes are over – networks don't operate like that.

One simple way to develop alternative narratives is to return to a canonical text like Boyle's, and suggest that this time we take its injunction to develop an 'environmentalism for the net' literally. The embrace of an 'environmentalism', or more broadly, political ecology as a possible integrative perspective, does not mean that this reduces the array of issues at stake to a mere politics of nature. Neither is it an attempt to elicit cheers for the corporatist rituals of environmental or worker's organising as we know it. Quite the contrary, many of the organisations already active in this area would welcome an infusion of tech-savvy net.cultural types, both in terms of support and novel ideas for sustaining networked forms of organisation and democratising the production of scientific authority. Getting involved, for example, in debates over whether or not the 1000+ substances used in electronics manufacturing – many of them suspected of being toxic, but protected by trade secrets – should be regulated differently, is not just a matter of occupational health and safety, or NGO-driven policy making, but implies the promotion of grassroots science. We celebrated such a democratisation with HIV/AIDS activism, and it lies at the root of some of the most radical strands of contemporary environmental justice. Why not do it again? Most importantly, the two books discussed here should be read not only from the individualist perspective of a radicalised consumerism, but also from within the horizon of these emergent networks that are struggling to find organisational forms most appropriate to the agenda and structure of such an environmentalism for the net. Such an approach would do more than just enlarge their audience – it would build a movement. So whichever way, let's figure out what such a new environmentalism of the net could look like. We need it.

p.s. The Dutch organisation [somo.nl](http://somo.nl) is currently building a European network in this area, German efforts are coordinated by WEED and its [pcglobal.org](http://pcglobal.org) project. Drop a line if you want to get involved.

*High Tech Trash: Digital Devices, Hidden Toxics, and Human Health*, by Elizabeth Grossmann, Washington et al: Island Press, 2006. 334 pages.

*Challenging the Chip: Labor Rights and Environmental Justice in the Global Electronics Industry*, by Ted Smith, David A. Sonnenfeld, and David Naguib Pellow, eds., Temple University Press 2006. 357 pages.

## FOOTNOTES

[1] More on WEEE and RoHS at [http://ec.europa.eu/environment/waste/weee\\_index.htm](http://ec.europa.eu/environment/waste/weee_index.htm). Also see the Eco-Design Directive (under development) at [http://ec.europa.eu/enterprise/eco\\_design/index\\_en.htm](http://ec.europa.eu/enterprise/eco_design/index_en.htm), as well as REACH

[http://ec.europa.eu/environment/chemicals/reach/reach\\_intro.htm](http://ec.europa.eu/environment/chemicals/reach/reach_intro.htm).

[2] David Naguib Pellow, *The Silicon Valley of Dreams: Environmental Injustice, Immigrant Workers, and the High-Tech Global Economy*, New York University Press 2003.

[3] Sarah Rich, 'High Tech Trash: An Interview with Elizabeth Grossman', *World Changing* (28 June 2006),  
<http://www.worldchanging.com/archives/004610.html>

[4] James Boyle, 'Politics of Intellectual Property: Environmentalism For the Net?', (1997),  
<http://www.law.duke.edu/boylesite/intprop.htm>.

[5] Digital Library of the Commons (DLC) <http://dlc.dlib.indiana.edu/>.

---