

California's E-Waste WASTE



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By Daniel R. Ballon, Ph.D.

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Pacific Research Institute
One Embarcadero Center, Suite 350
San Francisco, CA 94111
Tel: 415-989-0833/ 800-276-7600
Fax: 415-989-2411
Email: info@pacificresearch.org
www.pacificresearch.org

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Executive Summary

In 2003, California passed the nation's first law for recycling electronic waste (e-waste). The Electronic Waste Recycling Act (EWRA) charges consumers a fee when they purchase many consumer electronics products to fund a state-approved network of collectors and recyclers. Though 19 states and New York City have since passed their own e-waste recycling laws, only California taxes consumers to create a government-run program. As California faces rising budget shortfalls, this paper analyzes the history, performance, and consequences of the EWRA and investigates how market-driven reform can benefit the state's competitiveness, economy, and environment. The paper's findings are as follows:

- The EWRA initially favored industry-led initiatives over government-run bureaucracy, but changed abruptly in the chaos preceding the 2003 election to recall Governor Gray Davis.
- The law established a sweeping framework for government management of e-waste collection and recycling with no concrete model for program operation, no consideration of how many agencies and employees it would require, little existing infrastructure or expertise, and no reliable cost estimates.
- Recycling a single electronic item under the current system requires 12 distinct transactions across three separate agencies.
- Expenses have grown nearly three times as fast as revenue from 2004 to 2008, and the law contains no provisions to constrain rising fees.
- Yearly payments now exceed \$150 million, and the California Department of Finance has identified the program as "high risk for fraudulent activities."
- In Fiscal Year 2007-2008, less than half of all facilities audited were in complete compliance with program rules.
- Market incentives exist to drive the responsible collection, harvesting, and recycling of electronic waste.
- California's program eliminates incentives for industry to improve its products and practices.
- Industry-driven programs are most effective in mobilizing consumers to recycle obsolete electronics.
- By focusing on producer responsibility, other states aim to encourage creative industry-driven solutions that do not require supporting a complex bureaucracy.
- California's ranking in high-tech job creation has dropped from 1st to 19th since the EWRA took effect.

The paper makes several recommendations to reform e-waste recycling in California:

- 1) Replace the current government-run system with a framework that fosters innovative, manufacturer-led recycling solutions.
- 2) Establish the Streamlined E-Waste Recycling Project, a joint collaboration with colleagues in other states tasked with making state e-waste laws streamlined and consistent.
- 3) Develop education campaigns to increase awareness of industry-led recycling initiatives.
- 4) Establish guidelines and oversight to ensure that state agencies lead by example in recycling the government's e-waste.

Introduction: RIP, CRT

On June 12, 2009, over-the-air television broadcasters across the nation switched from analog to digital transmission. Though digital signals offer a clearer picture and better sound quality on every television, most consumers will need to upgrade their sets to take full advantage of digital technologies. According to the Environmental Protection Agency (EPA), 90 percent of the 705 million televisions sold from 1980 to 2007 rely on an underlying technology that has been in use for more than 75 years: the cathode ray tube (CRT).¹

The EPA estimates that between 80 and 85 percent of discarded CRTs end up in landfills, and each contains “on average four pounds of lead, in addition to other toxic materials such as brominated flame retardants, cadmium, mercury, and arsenic.”² Environmental activists such as Greenpeace International warn that landfills will face “a tsunami of electronic waste coming through because of this digital transition.”³

As new innovations render old technologies obsolete, consumers must constantly upgrade their electronic devices. Even though electronic waste, or e-waste, occupies only a small percentage of the overall waste stream, it represents the fastest-growing component. According to one estimate, Americans discard 350,000 cell phones and 130,000 computers every day.⁴ Though the federal government recommends proper e-waste recycling, it leaves the design and implementation of e-waste disposal programs to the discretion of individual states and localities.

In April 2009, the House of Representatives passed a bill (HR 1580) authorizing \$60 million over three years to fund private and academic studies of e-waste recycling strategies. In the meantime, however, Congress appears unlikely to preempt a rapidly growing patchwork of state rules, fees, and mandates.

Even though electronic waste, or e-waste, occupies only a small percentage of the overall waste stream, it represents the fastest-growing component.

With passage of the Electronic Waste Recycling Act in 2003 (SB 20), California became the first state to enact a plan for collecting and recycling e-waste. Under this program, consumers pay a fee (currently ranging from \$8 to \$25) when purchasing any electronic device containing a screen larger than four inches. These fees, known as Advanced Recovery Fees (ARFs), then fund recycling programs operated by a state-approved network of collectors and recyclers. Though 19 states and New York City now have e-waste programs, only California taxes consumers in order to manage its own state-run recycling infrastructure.

While other states give individual manufacturers the flexibility to design and implement their own private recycling programs, California relies on an inflexible government-managed approach. As CRTs disappear from the waste stream and manufacturers increasingly incorporate more valuable, higher quality, and greener components, market-driven recycling initiatives are beginning to arise. Companies are increasingly experimenting with new programs and partnerships to take back their own products and develop cost-effective recycling protocols.

California's framework bypasses these initiatives and discourages the evolution of cheaper, more efficient approaches. As explained by Renee St. Denis, Director of Recycling for Hewlett-Packard Americas, a “monopolistic recycling program” in California provides “no incentive for improvements over time—all products

are subject to the same fee regardless of the cost of recycling. Manufacturers and others have little incentive to reduce these costs . . . thereby likely resulting in higher overall costs.”⁵

This does not mean that manufacturers will stop developing more cost-effective, market-driven approaches, but that they will have no incentive to introduce them in California. As a result, Californians will face higher prices and reduced access to innovative recycling programs. This disparity will only grow over time and could reduce the state's competitiveness in a global economy.

Though CRTs represent the most expensive component of e-waste to recycle, most major manufacturers no longer produce them. In addition, California has strictly limited the sale of new CRTs since January 2007 and banned their disposal in landfills since 2001. Because California's program lacks any provision for expiration, it will continue to expand and tax new technologies long after a competitive private market for e-waste recycling evolves. According to a May 2009 Pike Research report, “the e-waste crisis will worsen over the next several years until 2015, when volume will peak at 73 million metric tons. However, the firm forecasts that global volumes will decline in 2016 and beyond, as a number of key e-waste initiatives begin to turn the tide.”⁶

Because California's program lacks any provision for expiration, it will continue to expand and tax new technologies long after a competitive private market for e-waste recycling evolves.

As Californians pay rising fees to address a shrinking problem, the state could cause manufacturers to delay the development of new products and innovations. After analyzing the effect of e-waste regulations on new product introduction, a March 2009 Stanford University study determined that imposing e-waste taxes at the point of sale (such as California's ARF) reduces “the quantity of electronics produced and disposed.” It accomplishes this, however, by “reducing the frequency of new product introduction.”⁷ California accounts for 15 percent of

electronics sold nationwide. The state's influence could therefore hold back disruptive new innovations that transform the market rapidly and unpredictably.⁸

In addition to the unintended damage e-waste taxes inflict on technological innovation, these taxes fund an expensive and complicated system. A year before ultimately signing SB 20 in 2003, Governor Gray Davis firmly rejected this approach, determining that such a bureaucracy “is not the most efficient or cost effective approach for California.”⁹ California's economic downturn and budget crisis emphasize the need for policies that minimize waste and inefficiency while fostering maximum innovation and economic growth.

This paper outlines the urgent need to reform California's e-waste recycling program and suggests how embracing market-driven initiatives will result in better outcomes, more competition, and higher-quality consumer electronics products.

History of SB 20

California's landmark Electronic Waste Recycling Act of 2003 was born out of chaos. A year after rejecting a state-run e-waste program and embracing innovative industry-initiated recycling programs as "a better model for California,"¹⁰ Governor Gray Davis abruptly reversed course. Upon signing SB 20 into law, Davis praised government as the best instrument for e-waste innovation: "California has led the technology revolution, and we will lead the way to safely managing computers and other electronic devices at the end of their life."¹¹ What prompted this policy reversal?

Davis signed SB 20 one week before the historic recall election that would remove him from office. In the midst of this political battle, Davis was criticized for embracing legislation that would mobilize environmentalists to oppose the recall. State Senator (and current Senate Majority Leader) Dean Florez (D-Shafter) observed that "the governor is sending clear signals that he will sign anything that lands on his desk that will make him look good . . . he is definitely using bills to pander to groups; there's no denying it."¹²

Even the main sponsor of SB 20, Californians Against Waste executive director Mark Murray, acknowledged that the governor's new support was politically motivated. "The dynamics of the recall help us," Murray noted, because "every signal we are getting from the administration is that it is important for this governor to be perceived as a friend of the environment."¹³

If not for the recall election, SB 20 would likely have focused on encouraging industry-driven recycling programs in lieu of a costly state-run infrastructure. The bill's author, Sen. Byron Sher (D-Palo Alto), initially worked with the governor and industry to create such a bill. Following the veto of his first e-waste proposal, the *San Francisco Chronicle* reported that "Sher used many of the governor's suggestions as a blueprint for the new bill."¹⁴ After nine months of deliberation and passage through the Senate, however, the bill was radically changed back to a state-run program only days before becoming law. This sudden change angered both environmentalists and industry.

Ted Smith, founder of the Silicon Valley Toxics Coalition, declared that "the legislative process was short-circuited by . . . the political chaos in Sacramento," while GrassRoots Recycling Network Executive Director David Wood voiced "serious concerns about how SB 20 changed at the 11th hour . . . to a government-managed program that is insufficient to safely manage hazardous electronic waste."¹⁵ A spokesman for Hewlett-Packard (HP), the state's largest computer manufacturer, lamented that the new SB 20 is not "the best way to go for the California business climate or for the environment" and would place "California companies at a competitive disadvantage."¹⁶

With little deliberation, SB 20 established a sweeping framework for government management of e-waste collection and recycling. Under this program, the state would charge a fee initially set at \$6 to \$10 on the purchase of covered electronic devices (depending on screen size) and use the proceeds to pay authorized recyclers \$0.48 per pound of electronic waste. These authorized recyclers would be responsible for paying authorized collectors \$0.20 per pound of waste collected. While the California Integrated Waste Management Board (CIWMB) was granted authority for administering the program, the hurried passage of SB 20 left open many logistical questions.

As a result, the legislature passed emergency legislation in an attempt to provide clarity. The committee analysis of one bill, AB 901, noted that "the waste board and the state Board of Equalization (BOE) are still not in agreement over such fundamental matters as who will collect the fee and what steps need to be taken to ensure timely and

effective implementation of the law.”¹⁷ In addition to coordinating the collection of fees by BOE and distribution of funds by the CIWMB, the final e-waste program involves a third agency: the California Department of Toxic Substances Control (DTSC), which must determine what electronic devices should be covered under the program.

In addressing the enormous logistical challenges these agencies faced, one CIWMB spokesman acknowledged that none of these organizations “had the infrastructure, the people or the ability to do it.” Even the bill’s sponsor was forced to admit that “so many people fell down on the job,” and “the biggest failure is bureaucracy’s failure to think out of the box.”¹⁸

The uncertainty involved in implementing this complex program also rendered any projected cost estimates highly speculative. The final Senate committee analysis of SB 20 estimated only that the program would require “substantial revenue, perhaps tens of millions of dollars annually, to the CIWMB to cover its costs of administering the consumer electronics recovery process, to cover the DTSC’s related costs, and to provide financial incentives and other subsidies to recyclers, local governments, and manufacturers.”¹⁹

The CIWMB acknowledged shortly after the program took effect that initial fee and reimbursement levels were arbitrary and significant adjustments would be necessary in the future. According to Chris Peck, a CIWMB spokesman, “we don’t really know if the 48 cents per pound we’re paying will cover costs as it’s supposed to do. The whole idea is that it will be in balance at some point in time.”²⁰ In achieving this balance, however, SB 20 contains no measures to prevent fees from skyrocketing. The state reevaluates the fees that consumers pay every two years, and by law, must raise them as necessary to keep the program solvent.

Implementing SB 20: California Gets Wasted

As more recyclers sign up to receive compensation from the state, rising costs will require drastic fee increases to replenish the state's Electronic Waste Recovery and Recycling Account (EWRRA). According to the CIWMB, direct payments to recyclers have outpaced revenue growth in the EWRRA by nearly threefold from 2004 to 2008. Facing these projections, even the CIWMB concedes that “the increase in fee levels may reduce consumer purchasing power, or possibly drive purchasing decisions to retail venues beyond the reach of BOE.”²¹

On Jan. 1, 2009, the CIWMB raised the fees by 100–150 percent on the majority of covered electronics sold within the state. These new fees, ranging from \$8 to \$25, could depress retail sales and slow economic recovery. According to a June 2009 study by market research firm iSuppli, flat-panel television sales are thriving in a down economy, increasing 17.3 percent in the first quarter of 2009 over the same period in 2008. iSuppli research analyst Riddhi Patel notes that “people are saying instead of taking trips during the summer, they may as well stay at home and buy a TV.”²² By significantly increasing the effective price of these products, California's e-waste fee could hurt a key area of growth for the state's consumer electronics industry.

This competitive disadvantage could increase as the CIWMB raises fees to support a cumbersome and inflexible state program. Under the current system, recycling a piece of electronic waste depends on a complex maze of interactions involving 12 distinct transactions across three agencies (figure 1). In addition to collecting fees from the sale of covered electronic devices, the state must also oversee and manage payments for 59 authorized recyclers and 608 collectors.²³

Under the current system, recycling a piece of electronic waste depends on a complex maze of interactions involving 12 distinct transactions across three agencies

While the CIWMB discloses that more than 630 million pounds of e-waste have been successfully recycled under the program,²⁴ these figures depend almost entirely on self-reporting from collectors and recyclers. Based upon reporting of their net costs, the state adjusts payment rates for program participants. In 2007, however, the CIWMB revoked the approval of more than two dozen collectors for failing to submit these net cost reports.²⁵ When documents are submitted correctly, how do regulators ensure that they are accurate?

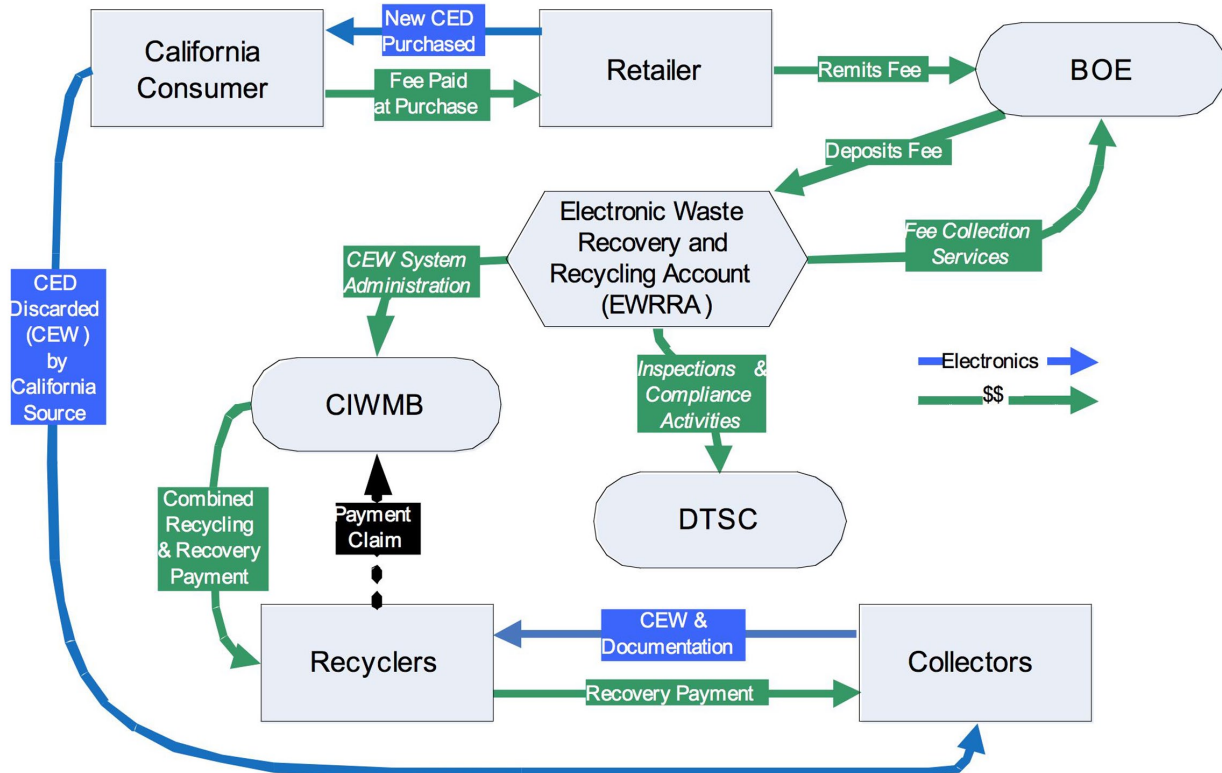
With payments now exceeding \$150 million every year, weak oversight could lead to fraud and abuse in the payment system. Observing that payment claims jumped from \$11.4 million to \$45.9 million in the program's first year alone,²⁶ the California Department of Finance (DOF) sent a letter to the CIWMB in November 2006 warning of a “high risk for fraudulent activities.”²⁷ The DOF observed several similarities with the state's can- and bottle-recycling program, which has been plagued by fraud since its inception. While state and federal prosecutors have uncovered more than \$11 million in can- and bottle-recycling fraud, the agency that administers this program acknowledges that “you only know about the ones you catch.”²⁸ A 2002 Golden Gate University study projects that actual fraud could be as high as \$40 million every year.²⁹

In response to these concerns, the CIWMB established a partnership with the DTSC in order to “detect, investigate, prosecute, and deter fraudulent activities” within the e-waste recycling program. This agreement established the E-Waste Fraud Team to ensure “fair play and competition among all of the participants in the system.”³⁰ The DTSC currently employs a small team of only four auditors for the entire program, and the

agency itself acknowledges that it conspicuously “stands apart” in “a government department dominated by scientists.”³¹ Inspections conducted by the E-Waste Fraud Team reveal considerable opportunities for abuse. In Fiscal Year 2007-2008, less than half of all facilities audited were in complete compliance with program rules.³² This represents an improvement over the 20 percent compliance rate in FY 2006-2007, but raises questions about the state’s ability to effectively minimize fraud, waste, and abuse in a large and complex government-run recycling program.

A May 2009 INTERPOL study raises additional concerns that e-waste programs could attract organized criminal enterprises. The report determined that the illegal export of e-waste to third-world countries is “a vast and lucrative industry” involving “theft, fraud, smuggling, conspiracy and money laundering.” INTERPOL concludes that “given the financial incentives and the sheer volume of e-waste, the environment appears ripe for organized crime to be involved.”³³ According to Jim Puckett of the Basel Action Network, an organization that combats the illegal export of toxic materials, California’s e-waste program could lead to taxpayer-funded criminal activity: “perversely, more waste than ever before will likely be exported, and this time it will be exported with the blessing and funding provided by the great state of California.”³⁴

**Figure 1
California E-Waste Recycling Process**



Acronyms:

CED: Covered Electronic Device

CEW: Covered Electronic Waste (Discarded CED)

BOE: Board of Equalization

CIWMB: California Integrated Waste Management Board

DTSC: Department of Toxic Substances Control

Source: California Integrated Waste Management Board

A Better Way for E-Waste

Is it necessary for California's consumers to fund a complex and inefficient e-waste program? In the six years since the passage of SB 20, a number of industry-driven programs have formed and flourished, demonstrating that market incentives exist to drive the responsible collection, harvesting, and recycling of electronic waste. While other states are embracing innovation in greener product design and creative models for taking back products at the ends of their lives, California's government-run approach is an impediment to this goal.

In addition to the pollutants California's program aims to divert from landfills, e-waste also contains highly valuable components such as gold, silver, platinum, aluminum, and copper. According to the U.S. Geological Survey (USGS), e-waste can contain 40 to 800 times the concentration of gold and 30 to 40 times the concentration of copper as ores mined in the United States.³⁵ As technologies improve, innovators are finding better ways to extract these valuable resources, and manufacturers are increasingly phasing out the use of pollutants. For this reason, the Chairman of the House of Representatives Committee on Science and Technology, Bart Gordon (D-TN), declared in November 2008 that "technology and innovation will have as much a role to play in solving the problem of e-waste as they did in its creation."³⁶

In bypassing this innovation with an inflexible government program, California could subsidize practices that don't require a subsidy. This discourages an emerging class of entrepreneurs hoping to profit from e-waste recycling. In 2008, for example, Ernst and Young gave an Entrepreneur of the Year award to the CEO of Fresno-based Electronic Recyclers International, John Shegerian. By "tapping into the rich collection of resources within discarded electronic items," Shegerian explains, he is "turning environmental responsibility into a profitable endeavor."³⁷ By next year, Shegerian's company expects to process 22 million pounds of electronic waste every month.³⁸

California's program also eliminates incentives for industry to improve its products and practices. As explained by David Isaacs, the former head of HP Federal Government Affairs, "If there's a fee, there's no incentive to improve product design and reduce the cost of recycling."³⁹ This could thwart substantial progress among manufacturers and recyclers to develop effective new programs and partnerships. Many of these companies actively collect a broad range of electronic waste, including items not covered under the California program.

HP, for instance, collects a wide spectrum of products regardless of brand, including computers, scanners, printers, monitors, and smart phones. In January 2009, the company began paying customers for their e-waste, and it projects that its cumulative recycling efforts will have eliminated two billion pounds of e-waste by the end of 2010.⁴⁰ Dell has successfully recycled 255 million pounds of its own products in the past two years alone, and IBM has recycled 1.5 billion pounds worldwide since 1995.⁴¹

Smaller manufacturers are also leveraging economies of scale through partnerships. In 2007, for example, Panasonic, Sharp, and Toshiba launched an initiative called the Electronic Manufacturers Recycling Management Company (MRM), and to date this program has brought together 21 manufacturers and retailers under a unified recycling effort. As explained by MRM Executive Director Tricia Conroy, "the power of MRM's platform is its capacity to help the electronics industry move beyond individual company programs that focus on only a single brand" and instead "make use of a common efficient system."⁴²

In addition to programs that encourage recycling at the end of a product's life, manufacturers are developing better labeling standards to give consumers the ability to exercise demand for greener products. One voluntary program managed by the nonprofit Green Electronics Council, the Electronic Product Environmental Assessment Tool (EPEAT), allows manufacturers to strive for bronze, silver, or gold status based on a product's compliance with 51 rigorous environmental criteria. Since 2006, this program has grown 30-fold, and today it covers more than 1,000 products.

Retailers are also helping consumers factor sustainability into purchasing decisions. Wal-Mart, the world's largest retailer, announced in July 2009 that it would develop a "sustainability index," prominently displaying a score on every product it sells. Instead of using taxes or mandates to force changes in product design, the Wal-Mart approach increases transparency and allows consumers to express their preferences. This could empower individuals to help drive the development of more recyclable electronics.

Under the California e-waste recycling regime, however, manufacturers have little incentive to promote such innovative programs within the state. Any voluntary producer-responsibility initiatives would be forced to compete with a massive taxpayer-backed recycling infrastructure. Fortunately, policy makers do not need to look far to find a model for e-waste recycling that embraces industry-led innovation. One year after the passage of SB 20, the legislature passed a new bill focusing on the 16.3 million cell phones discarded by Californians each year.⁴³

Any voluntary producer-responsibility initiatives would be forced to compete with a massive taxpayer-backed recycling infrastructure.

The Cell Phone Recycling Act of 2004 (AB 2901) does not create a state-run bureaucracy like SB 20 does, but instead establishes that "manufacturers and retailers . . . should have the flexibility . . . to develop and promote a safe and effective used cell phone recycling system for California."⁴⁴ By allowing industry the freedom to innovate, AB 2901 lets companies respond to the considerable market incentives for cell phone recycling. According to the EPA, "almost all of

the materials used to manufacture a cell phone can be recovered to make new products." As explained by Walter Engelbrecht, the co-founder of EcoPhones, "the irony here is that every time a phone is thrown into a landfill what you're really doing is burying treasure. We estimate that Californians are throwing away nearly \$50 million a year, maybe more."⁴⁵

By declining to compete with industry-driven initiatives, California has allowed these programs to flourish. To date, nearly every mobile phone carrier, manufacturer, and retailer actively seeks to collect and recycle used cell phones. All of these programs are profitable, and many companies donate the proceeds to charity.⁴⁶ In July 2009, for example, AT&T announced that it would expand its recycling efforts in over 2,000 retail stores and raise \$1 million for Cell Phones for Soldiers by the end of 2010.⁴⁷

Because private companies are best equipped to understand the needs of customers and communicate their messages effectively, industry-driven programs can most effectively mobilize consumers to recycle obsolete electronics. Even after the CIWMB spent \$1.1 million to enlist a PR firm, Ogilvy Public Relations Worldwide, most Californians remain unaware of the government-run e-waste recycling program they fund. According to a June 2008 survey, only 36 percent of state residents "were aware of the fee placed on the purchase of new

electronics to help pay for their proper disposal.” In addition, when asked “where they would go for more information about how to recycle an old television or computer monitor,” only 14 percent responded that they would contact the government.⁴⁸

In stark contrast, industry-led efforts to recycle cell phones have resulted in widespread public awareness. According to a nationwide survey conducted by CTIA – The Wireless Association, 84 percent of respondents understood that they could recycle their mobile phones, and 69 percent could identify specific industry programs.⁴⁹

As e-waste becomes increasingly valuable to collect and recycle, California’s government-run program threatens to crowd out a promising new crop of environmental entrepreneurs. In 2008, 1,200 small e-waste businesses generated more than \$3 billion in revenue.⁵⁰ At its e-waste recycling plant in Roseville, HP describes its operation as “a lot like old fashioned gold mining.”⁵¹ Unlike the first gold rush 160 years ago, however, e-waste prospectors may choose to stake their claim outside California.

Comparison Between States: Wasting Away in California:

Upon passage of SB 20 in 2003, Sen. Byron Sher (the bill's author) declared that "once again, California is leading the way as the first state in the nation to propose a solution to the e-waste crisis. I believe many other states will follow suit."⁵² As Sen. Sher predicted, 19 states and New York City have since enacted legislation for e-waste recycling, covering more than 50 percent of the U.S. population (figure 2a). In 2009, an additional 13 states introduced and considered their own recycling bills. While each of these bills and laws takes a slightly different approach, all stand in stark contrast to California's program.

Only California taxes consumers to fund a comprehensive state-run recycling infrastructure, preempting flexible and innovative industry-led initiatives. As states evaluate strategies for diverting e-waste from landfills, they have displayed a clear trend toward giving producers more flexibility and freedom to implement the programs and partnerships of their choice (figure 2b). Of the nine states passing e-waste legislation in 2008, five laws create minimal state-run infrastructure, instead relying entirely on manufacturers to develop and implement their own programs.

The most flexible approach to e-waste recycling was adopted by Texas in 2007 and replicated by Virginia, Oklahoma, and Missouri in 2008. These laws give manufacturers the responsibility and freedom to develop programs for recycling their products, but do not impose quotas, mandates, or fees. Because such frameworks rely entirely on manufacturers to develop an e-waste recycling infrastructure, they do not establish a state-run bureaucracy. By collecting and reporting data on the success of industry-led programs, these states foster competition between manufacturers and allow the most successful initiatives to rise to the top.

Laws in Michigan, Hawaii, and North Carolina also rely exclusively on industry-driven programs, but require that manufacturers pay a yearly registration fee. In Illinois, Minnesota, and Indiana, manufacturers must pay a yearly registration fee and also conform to government-mandated recycling quotas. New York City's law includes not only quotas, but also strict penalties and an additional requirement that manufacturers collect electronics directly from consumers' houses. Because of the estimated \$200 million compliance cost for this provision, a U.S. District Court judge issued a stay in July 2009, blocking implementation of the NYC program pending legal challenge.⁵³

Other states establish a government-administered program supported by manufacturers, but allow them to opt out by establishing a privately run alternative (only Maine and Connecticut lack such an opt-out provision). These laws do not mandate specific recycling quotas. Though individual programs vary considerably, laws in Washington, Oregon, Rhode Island, Maryland, New Jersey, and West Virginia take this general approach.

By focusing on producer responsibility, most states aim to encourage creative industry-driven solutions. According to the sponsor of Oklahoma's bill, "the whole point of this legislation is to give the manufacturers enough flexibility that they can comply with it through a variety of methods."⁵⁴ Even states that do create a state-run program funded by manufacturers allow these producers to opt out by demonstrating participation in an industry-led alternative. Because most large manufacturers already participate in recycling initiatives, these state programs require far less government-managed infrastructure than in California.

In Washington State, for example, manufacturers can pay to participate in a common recycling system, or they can develop their own alternative. Rather than establish a cumbersome state-run infrastructure, even the common

system is managed and administered by manufacturers. This increases flexibility and reduces bureaucracy. According to an analysis by the Connecticut Recyclers Coalition, Washington's program requires supporting 0.6 state employees per million residents, compared with 3.3 employees in California.⁵⁵ In contrast to manufacturer-led programs in other states, California taxpayers must pay to support a complex bureaucracy.

A study by the U.S. Department of Commerce in 2006 estimated overhead costs for California's system as high as 18 percent of total expenditures.⁵⁶ In a 2008 MIT analysis, California's e-waste processing costs were twice as high, and system-management costs were more than four times higher than with Maryland's producer-responsibility approach.⁵⁷ Unlike industry-driven programs in other states, where processing costs are determined by market forces, California regulators must arbitrarily set the state's reimbursement rates for e-waste collection and recycling. This makes it difficult to constrain costs and places California at a competitive disadvantage.

In contrast to manufacturer-led programs in other states, California taxpayers must pay to support a complex bureaucracy.

The sponsor of SB 20, Californians Against Waste, contends that these added costs are necessary to continue the state's "success in addressing the e-waste crisis."⁵⁸ While California leads the nation in the total amount of e-waste collected, the state also accounts for 15 percent of all electronics sold in the nation.⁵⁹ When recycling data are normalized to account for population, other state initiatives perform just as well as California's government-run program. According to figures compiled by the Electronics TakeBack Coalition, California

currently collects 5.91 pounds of e-waste per resident annually, while Washington State's manufacturer-led program collects 5.63 pounds. A slightly more stringent law in Minnesota, which establishes recycling goals based on a manufacturer's market share, has resulted in recycling of 6.46 pounds per resident.⁶⁰

Though California passed the nation's first e-waste recycling law, evidence demonstrates that programs fostering producer innovation are more efficient, cheaper, and equally effective. As a result, no state has opted to adopt California's government-run approach. Among states considering e-waste legislation, this model is increasingly viewed as flawed and outmoded. In 2007, four state legislatures debating e-waste bills considered versions modeled after California's law.⁶¹ In 2008, this number dropped to three, and of 13 states weighing e-waste bills in 2009, only South Carolina has a California-modeled bill on the table.⁶² As explained by Panasonic's Director of Environmental Affairs, David Thompson, "the policy debate [over e-recycling] has been largely finalized."⁶³

Even the CIWMB recognizes that the state's e-waste approach could put it at a competitive disadvantage and jeopardize its leadership in technological innovation. In February 2007, the Board unanimously adopted a strategic objective to encourage manufacturer-initiated recycling initiatives that would "create a setting for markets to emerge that truly reflect the environmental impacts of a product, and to which producers and consumers respond."⁶⁴ One board member declared that for hazardous-waste laws such as SB 20, "its legacy was actually the straw that broke the camel's back and truly illuminated the need for [producer responsibility]."⁶⁵

To meet this strategic objective, the Board adopted a "framework" for promoting producer responsibility. Recognizing that a centralized approach imposes burdensome fees and lacks "the flexibility to customize individual product stewardship plans toward the most effective approach for any particular product,"⁶⁶ the adopted framework specifically aims to "reduce the burden on taxpayers" and maximize "economic efficiency and market-based competition to stimulate innovation and reduce costs."⁶⁷

Compared to states with a producer-responsibility approach, California charges consumers a premium for bureaucracy, not results. The fee placed on electronic devices has several unfortunate and unintended consequences. It decreases sales, discourages introduction of new products, and crowds out an innovative market-driven e-waste recycling industry. As lawmakers look to cut costs in difficult economic times, reforming California's e-waste recycling program could be a win-win-win scenario that will benefit consumers, the environment, and the state treasury.

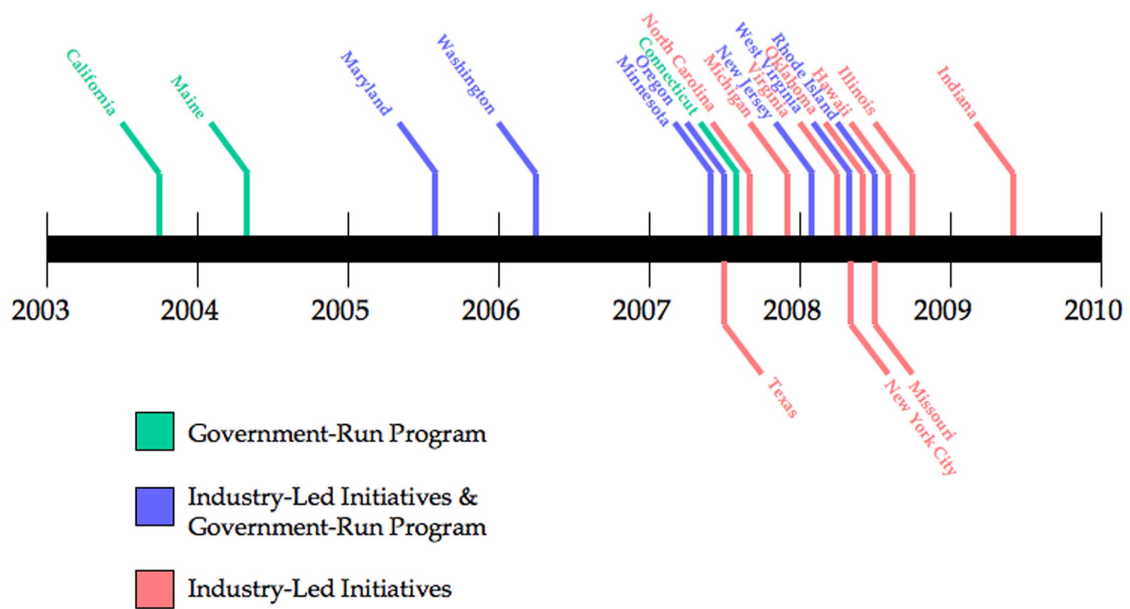
Figure 2a
State E-Waste Programs by Category

Date Adopted	State or City	Industry-Led Initiatives	Industry-Led Initiatives and Gov't-Run Program	Gov't-Run Program	Fee	Quotas and Mandates
June 2007	Texas	✓				
March 2008	Virginia	✓				
May 2008	Oklahoma	✓				
June 2008	Missouri	✓				
December 2008	Michigan	✓			Manufacturers pay annual \$3,000 fee.	
August 2007, Amended August 2008	North Carolina	✓			Computer Manufacturers: One-time \$10,000 fee and annual \$1,000 fee. Television Manufacturers: One-time \$2,500 fee and annual \$2,500 fee.	
July 2008	Hawaii	✓			Manufacturers pay annual \$5,000 fee.	
September 2008	Illinois	✓			Manufacturers pay \$5,000 in 2010. Fee increases automatically each year.	Mandates quota according to market share and statewide goal.
May 2009	Indiana	✓			Manufacturers pay one-time \$5,000 fee, annual \$2,500 fee, and variable recycling fee if producer fails to meet quota.	Manufacturers must recycle 60% of waste by weight sold in previous year.
April 2008	New York City	✓			Manufacturers pay one-time \$1,500 fee and annual \$1,250 fee.	Mandates quota based on market share, increasing every three years. Mandates collection "directly from a resident's home."
June 2008	Rhode Island		✓		Manufacturers pay annual \$5,000 fee and additional fee by weight for manufacturers participating in state program.	
April 2008	West Virginia		✓		Manufacturers pay one-time \$3,000 fee and \$500 annual fee, additional \$7000 one-time fee and \$4,500 annual fee for participation in state grant program.	

Figure 2a
State E-Waste Programs by Category Continued

Date Adopted	State or City	Industry-Led Initiatives	Industry-Led Initiatives and Gov't-Run Program	Gov't-Run Program	Fee	Quotas and Mandates
January 2008, Amended January 2009	New Jersey		✓		Manufacturers pay annual \$5,000 fee, and additional fee by weight for participating in state program.	
June 2007	Oregon		✓		Manufacturers pay \$40-\$15,000 annual fee based on market share, and additional fee for participating in state program.	
March 2006	Washington		✓		Manufacturers pay annual fee based on market share (\$7-\$42,587 in 2010), and additional fee for participating in state program.	
July 2005	Maryland		✓		Manufacturers pay one-time \$10,000 fee, \$500 annual fee, and additional \$4,500 annual fee for participating in state program.	
May 2007	Minnesota		✓		Manufacturers pay one-time \$5,000 fee, annual \$2,500 fee, and variable recycling fee based on market share.	Manufacturers must recycle 60% of devices sold in first year and 80% of devices in subsequent years.
July 2007	Connecticut			✓	Manufacturers pay one-time \$5,000 fee and annual registration fee based on market share to administer state program.	
April 2004	Maine			✓	Manufacturers pay actual recycling costs, billed through consolidation program run by municipalities.	
September 2003	California			✓	Consumers pay \$8-\$25 recycling fee at purchase based on screen size.	

Figure 2b
Timeline of State E-Waste Laws



Conclusion: Time to Trim California's Waste-Line

The legislature took a first step toward e-waste reform on July 24, 2009, by voting to eliminate the California Integrated Waste Management Board. The CIWMB had become a controversial symbol of government waste, inefficiency, and cronyism in Sacramento. During budget negotiations in June 2009, Governor Schwarzenegger declared that “we should not and I will not, cut a dollar from education or a dollar from health care or a dollar from public safety or a dollar from our state parks without first cutting the Waste Management Board.”⁶⁸

The proposal garnered bipartisan support and was carried by Assemblywoman Alyson Huber (D-Lodi) in the Assembly. As explained by Huber, “we have the largest state bureaucracy of any state in the union. I don't think this bill goes far enough . . . It is a good beginning.”⁶⁹ While this reorganization offers an opportunity for broad reform, it does not change how any of the state's recycling programs operate. Instead, all SB 20-related activities previously under the CIWMB will be transferred to a new Department of Resources, Recycling and Recovery within the California Resources Agency.

According to the annual TechAmerica Cyberstates report, California leads the nation in high-tech jobs, but this lead is vulnerable. If lawmakers continue taxing consumer electronics to fund a complex e-waste recycling system, manufacturers and entrepreneurs may increasingly opt to invest and innovate out of state.

When SB 20 took effect in 2005, California ranked first in the nation for high-tech job creation, generating 21,400 new jobs.⁷⁰ Only one year later, California's ranking plummeted to 19th, with only 2,000 new high-tech jobs created.⁷¹ In stark contrast, states that give manufacturers maximum flexibility to design their own recycling programs have witnessed dramatic job creation. Two of the first states to take this approach, Texas and Virginia, created seven times and two and a half times more high-tech jobs than California between 2006 and 2007, respectively.⁷²

As e-waste fees rise, this disparity will continue to grow, threatening California's leadership in technology and innovation. Facing the worst economic crisis since the Great Depression, lawmakers cannot afford to sacrifice one of the state's most important engines for economic growth and prosperity. The elimination of the CIWMB provides an ideal opportunity to fundamentally reform SB 20 and adopt policies that will ensure both a healthy economy and environment.

Recommendations

1) Recycle SB 20: The legislature should repeal the existing Electronic Waste Recycling Act and adopt an alternative, flexible framework that abandons the current government-run system in favor of innovative, manufacturer-led recycling solutions. Other states are rapidly adopting this model as market forces prove effective at driving the development of creative e-waste strategies. California remains the only state with a fee-based system, and rising costs will increasingly crowd out innovators, depress the market for high-tech electronics, send high-paying jobs out of state, and place the state at a competitive disadvantage. To benefit consumers, the environment, and the economy, California should follow the model adopted in Texas in 2007 and replicated in Virginia, Missouri, and Oklahoma in 2008. Because robust market incentives will increasingly drive the collection and recycling of most types of e-waste, this model does not require strict collection mandates or extensive and bureaucratic government oversight. By requiring only that manufacturers have a recycling strategy, this framework affords maximum flexibility to develop creative new programs or forge partnerships with other manufacturers, retailers, and entrepreneurs. By collecting information about recycling volumes and establishing an online data repository, the state can also encourage competition among industry-led recycling programs. Consumers motivated by environmental stewardship can use this database in purchasing decisions, and the most effective recycling strategies will quickly rise to the top.

2) Fix the E-Waste Patchwork: In developing a new framework for e-waste recycling, lawmakers should establish a joint collaboration with colleagues in other states tasked with making state e-waste laws streamlined and consistent. To date, 19 states and New York City have passed laws varying widely in structure and scope. This patchwork creates considerable compliance costs for all stakeholders. The National Center for Electronics Recycling estimates that manufacturers, retailers, collectors/recyclers, and government would save \$125 million annually by replacing 20 different programs with a single, consistent framework.⁷³ By taking the lead to create a Streamlined E-Waste Recycling Project, California can help spur reform that will benefit consumers nationwide. Because most electronics manufacturers market their products in all 50 states, reducing compliance costs will result in lower prices and more rapid introduction of new innovations.

3) Educate, Don't Mandate: Rather than punish consumers with e-waste fees or manufacturers with strict mandates, the government should develop education campaigns to increase awareness of industry-led recycling initiatives. While market incentives can effectively drive collection and recycling of most types of e-waste, the profitability of many programs will depend on economies of scale. By creating and promoting a central online repository of recycling programs, the state can educate consumers about free, simple, and abundant avenues for disposing of obsolete electronics. In addition, California already has the most stringent e-waste landfill ban of any state in the nation. By increasing enforcement of this existing ban, the state can help ensure that valuable electronics products are diverted from the waste stream to help increase the profitability and success of e-waste recycling programs.

4) Set a Better Example: State government agencies spent \$6 billion on technology in FY 2009,⁷⁴ yet government officials fail to properly recycle most obsolete electronics. According to an analysis of e-waste recycling conducted by the California Bureau of State Audits, more than 92 percent of e-waste at three agencies examined may have been discarded in the trash.⁷⁵ Before educating consumers about e-waste disposal (see above), policy makers should establish guidelines and oversight to ensure that state agencies lead by example.

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