

Guidance for the Awkward: Outgrowing the Adolescence of State Electronic Waste Laws

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INTRODUCTION: THE BIRTH AND DEATH OF ELECTRONICS

The average pet goldfish outlives most new high-tech goodies by nearly a decade.¹ While this fact bodes well for fish lovers, it should alarm everyone else. After just two or three years, many consumer electronics become outdated or cease to function.² The vast majority of obsolete televisions, iPods, cell phones, laptops, and other consumer electronics—sometimes called “e-waste”³—find a welcome resting place at municipal landfills. In fact, only 11.4% of e-waste generated in 2006 was collected for recycling, the *lowest* percentage since the Environmental Protection Agency (“EPA”) began recording e-waste statistics in 1999.⁴ While most electronics are helpful during their short lives, their afterlives are troubling.

Electronics manufacturers include a multitude of toxic materials in their products.⁵ Substances commonly found in a variety of electronic products compose five of the top seven most dangerous substances listed on the 2007 National Priority List for Hazardous Substances.⁶ When consumers discard electronic products containing these substances, serious risks for public health and the environment increase. Previously confined within the product, harmful materials can leach from e-waste into groundwater and streams.⁷ About 70% of

¹ Goldfish Information Website, http://www.goldfish-care.com/goldfish_facts.php (last visited Oct. 30, 2009).

² U.S. ENVTL. PROT. AGENCY, ELECTRONICS WASTE MANAGEMENT IN THE UNITED STATES: APPROACH ONE 12 (2008), *available at* <http://www.epa.gov/epawaste/conservematerials/ecycling/docs/app-1.pdf>.

³ For similar definitions, see Heather L. Drayton, Note, *The Economics of Electronic Waste Disposal Regulations*, 36 HOFSTRA L. REV. 149, 149 (2007); Rob Courtney, Note, *Evolving Hazardous Waste Policy for the Digital Era*, 25 STAN. ENVTL. L.J. 199, 200 (2006).

⁴ EPA, 2006 MUNICIPAL SOLID WASTE CHARACTERIZATION DATA TABLES 14 tbl.13 (2007), *available at* <http://www.epa.gov/epawaste/nonhaz/municipal/pubs/06data.pdf>.

⁵ See THE BASEL ACTION NETWORK & SILICON VALLEY TOXICS COALITION, EXPORTING HARM: THE HIGH-TECH TRASHING OF ASIA 9 (2002), *available at* <http://www.ban.org/E-waste/technotrashfinalcomp.pdf>. (“E-waste contains a witches’ brew of toxic substances such as lead and cadmium in circuit boards; lead oxide and cadmium in monitor cathode ray tubes (CRTs); mercury in switches and flat screen monitors; cadmium in computer batteries; polychlorinated biphenyls (PCBs) in older capacitors and transformers; and brominated flame retardants on printed circuit boards, plastic casings, cables and polyvinyl chloride (PVC) cable insulation that release highly toxic dioxins and furans when burned to retrieve copper from the wires.”). Coincidentally, this makes goldfish *safer* investments, as well as more durable.

⁶ Agency for Toxic Substances and Disease Registry, 2007 Priority List of Hazardous Substances, *available at* <http://www.atsdr.cdc.gov/cercla/07list.html> (last visited Nov. 4, 2009). For detailed descriptions of e-waste chemicals’ environmental and human health effects, see Agency for Toxic Substances & Disease Registry, Department of Health and Human Services, ToxFaq, <http://www.atsdr.cdc.gov/toxfaq.html> (last visited Oct. 13, 2009).

⁷ THE BASEL ACTION NETWORK & SILICON VALLEY TOXICS COALITION, *supra* note 5, at 9

toxic heavy metals in landfills come from discarded electronics.⁸ Furthermore, the EPA does not require municipal landfills receiving less than twenty tons of solid waste per day to monitor groundwater contamination.⁹ While tightly monitored “state of the art” landfills leach fewer toxins than older or poorly maintained landfills, even small amounts of certain toxins can cause remarkable damage.¹⁰

The average American household contains twenty-four electronic devices,¹¹ and electronics become more pervasive all the time.¹² Annual e-waste disposal in the United States grew by one million tons between 2000 and 2006, with the growth rate increasing exponentially over that period.¹³ The EPA estimates that in 2006 the United States generated 2.9 million tons of e-waste.¹⁴ E-waste also has claimed a progressively greater percentage of the total waste-stream each year since the EPA began figuring e-waste into its solid waste calculations in 1999,¹⁵ making it the fastest growing segment of our solid waste stream.¹⁶

Yet current e-waste disposal predictions may not reflect the actual quantities of electronics awaiting disposal. When computers and other electronics become obsolete, many consumers stockpile their e-waste in closets and basements rather than discard it.¹⁷ An estimated 235 million computers and televisions sat in storage in 2007.¹⁸ As closets and garages begin to overflow, years of

(citing REPORT FOR THE UNITED STATES ENVIRONMENTAL PROTECTION AGENCY, REGION IX, COMPUTERS, E-WASTE, AND PRODUCT STEWARDSHIP: IS CALIFORNIA READY FOR THE CHALLENGE 13 (2001)).

⁸ OFFICE OF INSPECTOR GEN., EVALUATION REPORT: MULTIPLE ACTIONS TAKEN TO ADDRESS ELECTRONIC WASTE, BUT EPA NEEDS TO PROVIDE CLEAR NATIONAL DIRECTION i (2004), available at <http://www.epa.gov/oig/reports/2004/20040901-2004-P-00028.pdf>.

⁹ 40 C.F.R. § 258.1(f) (2009).

¹⁰ Michael Lipske, *On a Remote Canadian Lake, Scientists Track Mercury's Path Through the Food Chain*, INSIDE SMITHSONIAN RES. (Smithsonian, Wash. D.C.), Autumn 2006 (describing a scientific experiment in which one sixth of a teaspoon added yearly to a twenty-two acre lake—the same amount as would be added by acid rain in much of the United States—increased mercury levels in fish by 400%-500%), available at http://www.si.edu/opa/insideresearch/articles/V14_Mercury.html.

¹¹ EPA, eCycling, <http://www.epa.gov/epawaste/conservematerials/ecycling/index.htm> (citing CONSUMER ELECTRONICS ASS'N., MARKET RESEARCH REPORT: TRENDS IN CE REUSE, RECYCLE AND REMOVAL (2008)).

¹² Major George J. Konoval, *Electronic Waste Control Legislation: Observations on a New Dimension in State Environmental Regulation*, 58 A.F. L. REV. 147, 150 (2006) (noting 37% increase in number of households owning at least one computer from 1997 to 2003, suggesting that individual, as opposed to household, computer ownership over the six-year time period experienced more dramatic increases).

¹³ EPA, *supra* note 4, at 13 tbl.12.

¹⁴ *Id.*

¹⁵ *Id.*

¹⁶ *Id.*

¹⁷ Konoval, *supra* note 12, at 150 (citing *Handling of Electronic Waste: Hearing before the Subcomm. on Superfund, Toxics, Risk and Waste Mgmt.*, 109th Cong. 1 (2000) (statement of John B. Stephenson, Director of Natural Resources and Environment, Government Accountability Office)).

¹⁸ U.S. ENVTL. PROT. AGENCY, *supra* note 2, at 25.

stockpiled e-waste sits poised to trickle into landfills. To exacerbate matters, the Federal Communication Commission's mandated transition from analog to digital television signal will likely send a wave of televisions into obsolescence—and landfills.¹⁹

States are scrambling to address the burgeoning e-waste crisis. In 2003, California passed the United States' first e-waste law, banning disposal of certain electronic products and providing convenient collection services.²⁰ Eighteen states followed suit—eleven during the 2006-2008 legislative session.²¹ E-waste statutes are young, untested, and proliferating quickly. In many ways, e-waste law is experiencing its most awkward developmental stage. Call it puberty. Or call it something else. But as state e-waste laws take shape and Congress begins to turn its legislative gears,²² constructive criticism is as vital as ever.

Electronic waste has received precious little attention from legal scholars.²³ This lack of scholarship illustrates the legal community's intellectual apathy toward the burgeoning e-waste crisis, and provides one explanation for e-waste's sluggish legal development. This Article begins to fill the critical void by exposing linguistic and systemic problems in state e-waste legislation, and proposing solutions thereto. Part I summarizes federal and state attempts to address e-waste disposal, ultimately finding that e-waste regulation is left entirely to varying state approaches. Part II identifies shortcomings in the dominant state-led approach to e-waste disposal. More specifically, the section addresses perverse incentives arising under state choices in funding mechanisms; costly limitations on program actors and public participation; failure to efficiently and adequately account for confidential information contained in electronics; and state programs' vulnerability to dormant Commerce Clause attack. Part III proposes solutions—some completely new, and some derived from particular state statutes—to the identified shortcomings.

¹⁹ For more information on the transition to digital television, see the Federal Communications Commission website for the digital transition, <http://www.dtv.gov> (last visited Oct. 11, 2009).

²⁰ CAL. PUB. RES. CODE §§ 42460-42486 (West 2008).

²¹ For a table of bill passage dates, see Electronics TakeBack Coalition, http://www.electronicstakeback.com/legislation/state_legislation.htm (last visited Oct. 11, 2009).

²² See H.R. Res. 1395, 110th Cong. (2008) (calling on the House of Representatives to commit to banning the export of toxic e-waste to developing countries); S. Res. 663, 110th Cong. (2008) (calling on the Senate to commit to banning the export of toxic e-waste to developing countries); *E-Waste: Can the Nation Handle Modern Refuse in the Digital Age?: Hearing Before the H. Comm. on Science and Tech.*, 110th Cong. (2008).

²³ At the time of this writing, less than a dozen legal articles seriously consider domestic e-waste disposal, more than half of them written by students. None of them focus directly on state legislation—to date, the only U.S. response to e-waste. See generally Noah Sachs, *Planning the Funeral at the Birth: Extended Producer Responsibility in the European Union and the United States*, 30 HARV. ENVTL. L. REV. 51, 53 (2007) (noting the “sparse attention in legal literature” that producer responsibility has received—let alone producer responsibility e-waste statutes).

I. LEGAL BACKGROUND

A. *Federal Regulation of Hazardous Waste: RCRA*

The Resource Conservation and Recovery Act (“RCRA”) is the primary federal vehicle for hazardous waste regulation.²⁴ RCRA provides rigorous “cradle-to-grave” standards for handling and disposing hazardous waste. Generators of hazardous waste are subject to onerous reporting and handling requirements at every stage of the hazardous waste’s movement.²⁵ Generators must ensure that their waste ends up in the care of an EPA-sanctioned hazardous waste treatment, storage, and disposal facility (“TSDF”).²⁶ TSDFs are obliged to handle, treat, or store the hazardous waste with the utmost care, as extensively defined by the EPA.²⁷

For all its regulatory bravado, however, RCRA provides surprisingly generous loopholes for hazardous waste to slide unchecked into landfills. For example, RCRA excludes entities generating less than 100 kilograms of hazardous waste per month (“small quantity generators”).²⁸ A considerable portion of small to midsize businesses would qualify for exemption as small quantity generators. Furthermore, households and facilities offering residential services, including hotels and RV parks, are exempt from RCRA.²⁹ Given the ubiquity of electronic products and RCRA’s porous structure, federal law is poorly suited to handle the national e-waste problem.³⁰ Accordingly, states are forming their own electronics recycling programs.

B. *State E-Waste Laws*

State electronic waste recycling laws vary. This Article does not attempt to comprehensively describe each recycling program; rather, it highlights aspects of particular programs to illustrate common weaknesses shared among many e-waste programs.

1. *Funding Mechanism*

Funding for any program can be tricky, and product recycling is no exception. In addition to taxpayers and consumers, manufacturers themselves are a potential source of funding. States have widely varying funding schemes, but in

²⁴ See 42 U.S.C. §§ 6901-6991 (2006).

²⁵ *Id.* § 6922(a)(5).

²⁶ *Id.*

²⁷ *Id.* §§ 6924-6925.

²⁸ *Id.* § 6921(d).

²⁹ 40 C.F.R. § 261.4(b)(1) (2004).

³⁰ For a more extensive treatment of RCRA’s inadequacy to cope with e-waste, see Rob Courtney, Note, *Evolving Hazardous Waste Policy for the Digital Era*, 25 STAN. ENVTL. L.J. 199, 200 (2006).

terms of philosophical approaches to e-waste, only two categories exist: California, and everyone else.

a. Advanced Recovery Fee: California

California has the first and only e-waste recycling program predicated on an advanced recovery fee (“ARF”) approach. Under ARF, consumers pay the costs of the e-waste recycling program through a visible fee at the time of purchase. Proponents of ARF would say that consumers, as beneficiaries of electronic products and as ultimate discarders of e-waste, properly bear the financial onus of ensuring responsible disposal of their electronics.³¹ In California, consumers pay a \$6 to \$10 fee, depending on screen size, at the point of sale for all “covered electronic device[s].”³² Retailers deposit the collected fees in the state-administered Electronic Waste Recovery and Recycling Account (“the Account”).³³ The California Integrated Waste Management Board may use Account funds to pay collectors, recyclers, and administrative costs.³⁴

Manufacturers have few responsibilities under this scheme. The e-waste program imposes only informational duties on manufacturers, mostly intended to help program administrators evaluate the program’s success. Requirements include clear labeling, sales reporting, reporting on recycling efforts, and disclosure to the public of where and how to recycle electronics.³⁵ Manufacturers bear no financial responsibility, and do not participate as collectors or recyclers.

b. Extended Producer Responsibility: Everyone Else

The extended producer responsibility (“EPR”) approach, shared by eighteen of nineteen existing e-waste laws,³⁶ uses design incentives as the centerpiece of the e-waste solution.³⁷ Proponents of EPR would say that manufacturers, as engineers, producers, and financial beneficiaries of toxic electronic products, properly bear the financial onus of ensuring responsible disposal of their electronics.³⁸ Because manufacturers are best situated to conduct cost-benefit analyses of redesign and potential reuses of their products, they are also the

³¹ See Sachs, *supra* note 23, at 65-66.

³² CAL. PUB. RES. CODE § 42464(a)(1)-(3) (West 2009).

³³ *Id.* § 42476(a).

³⁴ *Id.* §§ 42476(a)-(b).

³⁵ *Id.* § 42465.2(a)(2).

³⁶ For a table listing state e-waste laws by EPR and ARF, see Electronics TakeBack Coalition, *supra* note 21.

³⁷ Sachs, *supra* note 23, at 75 (“Providing incentives for ecological design of products is a kind of holy grail for EPR proponents, and advocates argue that the design incentives are the primary rationale for involving product manufacturers in end-of-life waste management.” (citing ORG. FOR ECON. COOPERATION AND DEV., EXTENDED PRODUCER RESPONSIBILITY: A GUIDANCE MANUAL FOR GOVERNMENTS 19 (2001))).

³⁸ Sachs, *supra* note 23, at 62-63.

“least-cost avoiders”³⁹ of social costs associated with disposal of their products.
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States implement EPR by charging a uniform per-pound fee for each producer’s respective portion of the e-waste stream. Connecticut⁴¹ and Rhode Island,⁴² for example, require recycling fees to be weight-based, and not to exceed \$0.50 per pound. Curiously, Maine’s legislature delegated fee-setting to the primary beneficiaries of the fee—recyclers—by commanding the administrating agency to determine merely the “criteria that [recyclers] must use to determine reasonable operational costs attributable to the handling of computer monitors and televisions.”⁴³ While leaving the exact charge to be set by recyclers, the administrating agency promulgated a regulation⁴⁴ effectively requiring per pound recycling fees to be uniform for all manufacturers, regardless of product brand or type.⁴⁵

In theory, when producers bear the recycling costs of their products, those costs are passed to consumers and offset through higher prices.⁴⁶ Producers compete with one another to offer lower prices to consumers—which includes recycling costs.⁴⁷ Thus, producers who can minimize recycling costs possess a competitive advantage in the electronics marketplace.⁴⁸ In this way, EPR injects “green” design into the competitive equation.⁴⁹

³⁹ James Salzman, *Symposium on Population Law: Sustainable Consumption and the Law*, 27 ENVTL. L. 1243, 1278 n.158 (1997) (“[I]n the absence of certainty as to whether a benefit is worth its costs to society . . . the cost should be put on the party or activity best located to make such a cost-benefit analysis . . . in particular contexts like accidents or pollution this suggests putting costs on the party or activity which can most cheaply avoid them.” (quoting Guido Calabresi & A. Douglas Melamed, *Property Rules, Liability Rules, and Inalienability: One View of the Cathedral*, 85 HARV. L. REV. 1089, 1096-97 (1972))).

⁴⁰ See Sachs, *supra* note 23, at 67; Salzman, *supra* note 39, at 1279 (“Industry is better placed as the least-cost avoider [of recycling costs and virgin material consumption, therefore] . . . EPR take-back programs minimize social costs.”).

⁴¹ CONN. GEN. STAT. § 22a-631(c) (2008) (“[R]ecycler[s] shall . . . record[] brand and weight of each [covered electronic device] . . . and invoice manufacturers quarterly for the reasonable costs of transporting and recycling . . . on a per pound basis . . . not [] exceed[ing] fifty cents per pound . . .”).

⁴² R.I. GEN. LAWS § 23-24.10-11(d)(1) (2009) (administrating agency shall determine “recycling fee based on manufacturer’s . . . return share by weight The fee shall be calculated on a per pound basis and shall not exceed fifty cents.”).

⁴³ ME. REV. STAT. ANN. tit. 38, § 1620(5) (2008) (emphasis added).

⁴⁴ 06-096-415 ME. CODE R. § (2)(C)(8) (Weil 2007) (manufacturers billed for “[c]osts billed to the consolidator by a qualified recycling and dismantling facilit[y] for recycling,” but no provision for recyclers to calculate per pound costs specific to any particular manufacturer), available at <http://www.maine.gov/sos/cec/rules/06/096/096c415.doc>.

⁴⁵ This further raises concerns about the nondelegation doctrine that are beyond the scope of this Article.

⁴⁶ See Sachs, *supra* note 23, at 56.

⁴⁷ See *id.*

⁴⁸ See generally *id.*

⁴⁹ But see *id.* at 97 (noting the potential that producers will respond to consumer demand for more recyclable products under ARF even without EPR incentives).

To reduce recycling costs, producers must reduce the overall mass of the product and use fewer toxic materials. Under EPR, less toxic product designs render e-waste less threatening when not recycled. Ironically, the longer an EPR recycling program operates to drive green design, the more unnecessary it becomes to protect public health and the environment. EPR addresses the root of the problem—product toxicity—rather than reacting to contain the rapid increase in toxic e-waste.

If manufacturers have a vested interest in the efficiency of the recycling program, as they might under an EPR regime, then they have incentives to create independent recycling programs or compete within state operated programs. Manufacturers would operate within the quality standards set forth in the program—as would all collectors and recyclers⁵⁰—while removing e-waste collection burdens from less efficient municipalities, and competing with other recyclers to minimize program costs. Given the superior resources of many electronics manufacturers, this scenario is probable—and desirable. Thus, EPR also functions to maximize efficiency and streamline execution of state e-waste laws. All non-Californian e-waste recycling programs follow EPR. Whether as a matter of principle or pragmatism, e-waste management is clearly trending away from ARF and toward EPR.

2. Program Actors

Many states mandate which parties will act as collectors and recyclers. In many cases, municipalities are drafted into servitude, while other states utilize existing infrastructure and readily incorporate private, public, and nonprofit actors. All programs must fill a few basic roles: collecting, transporting, sorting, and recycling.

Maine subscribes to an EPR e-waste scheme, but producer responsibility begins well after initial collection. Maine's e-waste law requires municipalities alone to organize and pay for e-waste collection in their respective jurisdictions.⁵¹ Should a municipality choose not to participate, the program would cease to function in that geographic area.⁵² Municipalities decide whether to hold single-day collection drives, ongoing collections, or to require residents to deliver directly to a nearby "consolidation facility."⁵³ Municipalities deliver e-waste to consolidators,⁵⁴ who sort it by brand name and send it to

⁵⁰ See, e.g., MINN. STAT. § 115A.1318(2)(a) (2008). But see, e.g., MICH. COMP. LAWS § 324.17309 (2008) (no explicit recycling quality standards).

⁵¹ See ME. REV. STAT. ANN. tit. 38, § 1610(5)(A) (2008).

⁵² By its terms, Maine's statute permits municipalities to "choose" whether to act as collectors in the e-waste program, but it makes no provision for collection services in the event that municipalities decline. *Id.* This language may be the legislature's attempt to avoid an "unfunded mandate."

⁵³ See generally *id.*

⁵⁴ *Id.*

authorized recycling facilities.⁵⁵ Producers reimburse consolidators for handling and recycling costs, but do not reimburse municipalities for collection costs.⁵⁶

Connecticut combines servitude with existing infrastructure by permitting nonprofits, manufacturers, and other for-profit corporations to register as collectors, but *requiring* municipalities to do so.⁵⁷ Like other collectors, municipalities are compensated by producers, but, unlike other collectors in the program, municipalities must participate in the statewide program.⁵⁸

In California, authorized collectors—municipalities or private organizations—receive defunct electronics from consumers.⁵⁹ Collectors deliver the electronics to authorized recyclers.⁶⁰ Collectors submit invoices to recyclers or directly to the Integrated Waste Management Board (“the Board”) for reimbursement.⁶¹ Recyclers submit invoices to the Board for reimbursement of recycling and collection costs.⁶² Anyone able to meet the standards for a given role may register to act in that role and compete with other parties acting in the same capacity.⁶³ Similarly, and most commonly, state e-waste laws simply direct the administering agency to, “[t]o the extent practicable, use existing local collection, transportation and recycling infrastructure.”⁶⁴

In addition to prescribing program actors, states make ready provisions for manufacturers to establish their own independent recycling programs,⁶⁵ subject to quality and reporting requirements.⁶⁶ Manufacturer programs substitute for manufacturers’ participation in the state organized recycling programs,⁶⁷ or partially substitute inasmuch as the manufacturer is capable of collecting independently.⁶⁸ These separate manufacturer programs are subject to state

⁵⁵ *Id.* § 1610(5)(B)(1), (4).

⁵⁶ *See id.* § 1610(5)(D)(1).

⁵⁷ *See* CONN. GEN. STAT. § 22a-631(b) (2008).

⁵⁸ *Id.*

⁵⁹ CAL. PUB. RES. CODE § 42463(b) (West 2008).

⁶⁰ *See id.* § 42478.

⁶¹ *See id.* § 42477(b).

⁶² *See id.*

⁶³ *See id.* § 42463(b).

⁶⁴ R.I. GEN. LAWS § 23-24.10-11(a)(1) (2008); OR. REV. STAT. § 459A.340(4)(a) (2008). Similar language is found elsewhere. *See* TEX. HEALTH & SAFETY CODE ANN. § 361.955(e) (Vernon 2008) (“Collection services under this section may use existing collection and consolidation infrastructure for handling computer equipment . . .”).

⁶⁵ *See, e.g.*, WASH. REV. CODE § 70.95N.050 (2008).

⁶⁶ *See, e.g., id.* § 70.95N.060 (requiring manufacturer plans to describe how program will operate, compensation of collectors and processors, provision of convenient collection services, processes and methods used to recycle products, accounting and reporting systems, a program timeline, and public information campaigns).

⁶⁷ *See, e.g., id.* § 70.95N.050(3) (“An individual manufacturer submitting an independent plan to the department is responsible for collecting, transporting, and recycling its equivalent share of covered electronic products.”).

⁶⁸ *See* CONN. GEN. STAT. § 22a-631(e) (2009) (merely requiring independent manufacturer programs to report “total weight of [covered electronic devices] collected, transported, and recycled the previous year” without requiring any specific volume).

approval.⁶⁹

3. Public Participation: *Who May Recycle How Much of What?*

State e-waste laws come in all shapes and sizes, reflecting varying political realities.⁷⁰ Some states remain reticent to establish robust recycling programs, while others demonstrate remarkable temerity. States adjust three factors to determine the scope of their respective recycling programs: (1) the types of products covered by the program, (2) the quantities of products covered by the program, and (3) the persons qualified to participate in the program.

First, the types of products covered by the program—from televisions to headphones—can significantly affect the size of e-waste programs. Electronics manufacturers offer a stunning array of gadgets, large and small, to assist in practically every task,⁷¹ and e-waste laws may cover any number of electronic products along a virtually unlimited spectrum. “Covered electronic devices” in California—those requiring a fee at the time of purchase for subsequent recycling—are defined as products with video display screens greater than four inches, including monitors, televisions, laptops, and portable DVD players.⁷² Computers and many other electronics without screens, however, are not covered under the recycling scheme. Rhode Island law, on the other hand, covers the recycling of computers, monitors, and televisions, but not computer peripherals like keyboards, mice, or printers.⁷³ Connecticut provides a relatively broad scope of qualifying e-waste. It includes televisions, monitors, laptops, computers, and “any other similar or peripheral electronic device” specified in subsequent regulations.⁷⁴

Second, the quantity collected determines the extent to which e-waste programs cover selected products. Many states set outright landfill bans on covered product types, thereby mandating their total inclusion in the recycling program.⁷⁵ Other states establish adjustable recycling goals that mandate recycling for only a fraction of covered product types.⁷⁶

Third, states may limit whose covered products may be recycled under the

⁶⁹ See, e.g., WASH. REV. CODE § 70.95N.070(2).

⁷⁰ See Sachs, *supra* note 23, at 87 (noting that conservative political forces have slowed the adoption of electronic waste legislation in the United States).

⁷¹ A Google search for “weird gadgets” produced everything from Honda-made sex robots to electronic ghost detectors.

⁷² CAL. PUB. RES. CODE § 42463(f)(1) (West 2008).

⁷³ R.I. GEN. LAWS § 23-24.10-3 (2008).

⁷⁴ CONN. GEN. STAT. § 22a-629(5) (2008).

⁷⁵ *Id.* § 22a-636; OR. REV. STAT. § 459.247(1)(f) (2008); N.J. STAT. ANN. § C.13:1E-99.109 (West 2009); 415 ILL. COMP. STAT. 150/95 (2009) (landfill ban begins in 2012).

⁷⁶ See MINN. STAT. § 115A.1314(1)(b)(2) (2008) (manufacturers must ensure the recycle of 60% of covered electronic devices sold the first year of the program, and 80% each year thereafter). For a mind boggling set of calculations to determine recycling goals, see 415 ILL. COMP. STAT. 150/15-17 (2009).

programs. Maine's e-waste program covers computers, monitors, and televisions, but all consumers cannot recycle those items free of charge. The law forces manufacturers to pay for e-waste generated only by households.⁷⁷ Thus, small and mid-sized businesses, schools, nonprofits, and other entities not covered by RCRA are likewise not covered by the state program. Rhode Island's program expands free e-waste recycling to households and elementary and secondary schools,⁷⁸ while Texas places no limits on whose products are covered.⁷⁹

In addition to end-of-life product discrimination, state programs can also set restrictions on products entering the market. California⁸⁰ and New Jersey⁸¹, for example, ban the sale of electronics that are not compliant with the European Union's Restriction of the Use of Certain Hazardous Substances in Electrical and Electronic Equipment ("RoHS") Directive.⁸² Most states avoid such brash command-and-control regulation at the electronics design stage, preferring instead to establish market design incentives through end-of-life fees.

4. Out-Of-State Restrictions

Electronic recycling without fees at the point of recycle is a new phenomenon with potentially tremendous popular appeal. Recognizing the need to circumscribe state programs to manageable sizes, states have limited the scope of their programs to include only in-state generated waste and in-state program actors.

Small northeastern states presumably have the most trouble keeping neighbor states' e-waste out of their programs. Maine deals with the problem by restricting program coverage to e-waste "generated by a household in [Maine]."⁸³ Rhode Island excludes electronic waste not discarded by "households or public and private elementary and secondary schools in Rhode Island."⁸⁴ Connecticut assures free recycling to "residents" only.⁸⁵ Other states promulgate similar restrictions on out-of-state waste.⁸⁶ Less populous regions

⁷⁷ ME. REV. STAT. ANN. tit. 38, at § 1610(5)(B)(1) (2008).

⁷⁸ R.I. GEN. LAWS § 23-24.10-6 (2008).

⁷⁹ TEX. HEALTH & SAFETY CODE ANN. § 361.955(c) (Vernon 2008) ("The collection of [e-waste] . . . must be (1) reasonably convenient and available to consumers in this state; and (2) designed to meet the collection needs of consumers in this state").

⁸⁰ CAL. HEALTH & SAFETY CODE § 25214.10(b) (2008).

⁸¹ N.J. STAT. ANN. § C.13:1E-99.101 (West 2009).

⁸² In 2003, the European Parliament and the Council of the European Union issued the Restriction of the Use of Certain Hazardous Substances in Electrical and Electronic Equipment (RoHS) Directive to restrict the use of hazardous materials in electronic products to specified levels. Council Directive 2002/95, 2003 O.J. (L 37) 19 (EC).

⁸³ ME. REV. STAT. ANN. tit. 38, § 1610(5)(B)(1) (2008).

⁸⁴ R.I. GEN. LAWS § 23-24.10-6 (2008).

⁸⁵ CONN. GEN. STAT. § 22a-635(b) (2008).

⁸⁶ TEX. HEALTH & SAFETY CODE ANN. § 361.954(a) (Vernon 2008) (applies only to "consumers in this state"); MICH. COMP. LAWS § 324.17309(c) (2008) (applies only to "consumers

reflect less concern with out-of-state restrictions. Indeed, Minnesota's program applies to covered e-waste from "households," apparently without regard to the location of the "household."⁸⁷

Some states restrict not only out-of-state waste, but also passively limit who may collect and recycle that waste by favoring local actors. Several states urge the administering agency to "use existing *local* collection, transportation and recycling infrastructure."⁸⁸ States vary in their approach to restricting the program actors, however, and not all states order the administering agencies to favor local actors.⁸⁹

II. PROBLEMS

A. *The Evisceration of EPR*

The brilliance of EPR lies in its market-based coercive power. Producers experience weighty incentives to directly partake in the recycling process—whether at the collection, sorting, or recycling phase—to ensure efficiency and reduce costs. Producers might also alter the product itself to reduce the costs of recycling. In theory, producers respond to "internalized" recycling costs by improving program efficiency and product recyclability.

1. EPR Funding Mechanism: Weight-Based Fee Regime

Both ARF and EPR function to keep "downstream" toxic e-waste from landfills, but EPR's most striking innovation places "upstream" design incentives on manufacturers with a vision to end the toxicity problem altogether.⁹⁰ EPR's added task of sorting e-waste by manufacturer—to determine each manufacturer's share of the program costs—would be a monumental waste of resources if it failed to impose green design incentives on manufacturers.⁹¹ Remarkably, despite rightly identifying such incentives as a primary objective of their respective e-waste programs,⁹² most⁹³ EPR states

in this state").

⁸⁷ MINN. STAT. § 115A.1318(1)(c) (2008).

⁸⁸ R.I. GEN. LAWS § 23-24.10-11(a)(1) (2008); OR. REV. STAT. § 459A.340(4)(a) (2008) (emphasis added).

⁸⁹ *E.g.*, MICH. COMP. LAWS § 324.17303(c)(iii)(C) (2008) (reports on the program shall include "the addresses of [the] recycler's recycling facilities in this state, *if any*") (emphasis added). Most states are silent on the matter.

⁹⁰ *See* Salzman, *supra* note 39, at 1278. ARF and EPR also similarly reduce "upstream" demand on mineral mining by making recycled raw materials available for reuse. *Id.*

⁹¹ *See* Sachs, *supra* note 23, at 80.

⁹² *See, e.g.*, R.I. GEN. LAWS § 23-24.10-1(5) (2008) ("The purposes of this act are: . . . [t]o encourage the design of covered electronic products that are less toxic, more durable and more recyclable.").

⁹³ A few states do not impose a fee at all by requiring manufacturers to set up recycling programs. *E.g.*, TEX. HEALTH & SAFETY CODE ANN. § 361.951-66 (Vernon 2008). In such states

emasculate these incentives by imposing a uniform, per-pound fee across all manufacturers.⁹⁴

States instruct the administrating agencies to find an average recycling cost for all manufacturers' products.⁹⁵ That average amounts to a single per-pound charge, and manufacturers pay that charge for their respective weight portions of the e-waste stream. While paying for different volumes, all manufacturers pay the same rate. Underlying EPR is the hope that manufacturers will minimize recycling costs by designing less toxic electronics, but under a weight-based regime, recycling costs depend solely upon product weight. As a result, rather than shifting research and development spending to greener designs and reduced toxicity, manufacturers might as well continue on their quest toward all things "mini." After all, a condensed toxic bomb would reduce recycling fees to manufacturers despite increasing recycling costs in fact. Weight based fees twist EPR so that "green" producers overpay to recycle their products—thereby blunting the pecuniary benefits of green design innovation. In other words, producers of more recyclable products pay an industry-average fee that reflects the high recycling costs of other producers' less-recyclable products. These "green" producers pay more than their share of the program costs to recyclers.

Even if weight were positively correlated with toxicity, consumer demand already provides abundant incentives to develop lighter-weight electronics. The risk of inhaling cell phones and iPods has never been greater. Legislation pushing lighter weight electronics is not likely to have any appreciable effect on product size, because product size is already the singular obsession of most electronics manufacturers.

Furthermore, a uniform fee system creates a perfect "tragedy of the commons,"⁹⁶ effectively chilling green innovation. If *A* must reimburse recyclers for recycling *A*'s products on the basis of an industry-wide average, the benefits of *A*'s recyclability innovations are divided among the entire industry. The design dollars invested by *A* ultimately reduce the recycling fees of *A*, *B*, *C*, and *D* and so on. The most economically sensible way for *A* to reduce recycling costs would be to wait for someone else to invest in green design. In fact, a uniform fee encourages a "race to the bottom" so long as *A*, *B*, *C*, or *D* could reduce overall production costs by using more toxic components, and spread the increased recycling costs of the "ungreen" innovation across all manufacturers. Thus, uniform fees actually make green design the *worst* decision for manufacturers, as a single manufacturer bears the costs while all enjoy the benefits.

no public program is offered.

⁹⁴ See R.I. GEN. LAWS § 23-24.10-11(d)(2) (the administrating agency "shall set the cost per pound for collection, transportation, and recycling of covered electronic products . . . to reasonably approximate market costs" for such services).

⁹⁵ *Id.*

⁹⁶ See generally Garrett Hardin, *The Tragedy of the Commons*, 162 SCIENCE 1243 (1968).

2. “E-Waste Leakage”

In the world of carbon trading, scholars refer to “emissions leakage” to describe the phenomenon of improving domestic emissions standards only to lose market share to heavy emitting foreign markets, thereby achieving a zero net reduction in carbon emissions.⁹⁷ As in the carbon context, environmental improvements to electronics involve costs to manufacturers. If those costs are not reciprocated by foreign competitors, a sort of e-waste “leakage” could follow. Clean products would lose ground in the marketplace to cheaper, more toxic products.

Under a uniform fee regime, less toxic American manufacturers will “overpay” in state recycling programs, while more toxic foreign manufacturers will “underpay” relative to the actual costs of recycling.⁹⁸ Due to research and development costs and increased materials costs,⁹⁹ every step towards “green” design by an American manufacturer, with benefits shared by foreign and domestic manufacturers alike, would likely signal a loss of market share to toxic foreign producers. Without any pecuniary advantage to offering a greener product,¹⁰⁰ the newly “greened” electronic will carry a higher price without offering consumers improved performance. Inversely, every step away from “green” design by foreign manufacturers, with expensive recycling costs shared by foreign and domestic manufacturers alike, would increase market share, as they could offer lower prices without compromising product performance.

Even if state programs or consumer demand¹⁰¹ could effectively encourage both foreign and domestic producers to invest in greener product designs, foreign producers could offset “greening” costs more easily than American producers. Many foreign manufacturers could do so by externalizing business costs.¹⁰² For example, let us imagine that electronics are graded by a “greenness” scale of five stars. If companies *A* and *B* sell two-star products and want to achieve a five-star “green” rating with those products, then they will

⁹⁷ TREVOR HOUSER ET AL., *LEVELING THE CARBON PLAYING FIELD: INTERNATIONAL COMPETITION AND US CLIMATE POLICY DESIGN 2* (2008).

⁹⁸ *Supra* Part II.A.1.

⁹⁹ Jeremy A. Kaplan, *The Green PCs*, PC MAG., Mar. 17, 2008, available at <http://www.pcmag.com/article2/0,2817,2275501,00.asp> (noting that “greener” computer materials cost approximately 10% more than ordinary components).

¹⁰⁰ Again, absence of pecuniary advantage assumes a uniform fee system. *See supra* Part II.A.1. Other fee systems may provide greener electronics with a decisive pecuniary advantage. *See infra* Part III.A.1-2.

¹⁰¹ Consumer demand for green electronics is belied by even a cursory survey of electronics literature. A Lexis search for articles in *PC Magazine*, *ComputerWorld*, and *Computers* containing the word “recyclability” produced five articles. An identical search for “performance” produced an error because the result exceeded 3,000 articles. *But see* Apple Green Ad Campaign, <http://www.apple.com/environment> (last visited Oct. 11, 2009).

¹⁰² For example, some countries permit abusive labor practices, impose few environmental standards on manufacturing processes, and provide cheap, heavy-emitting energy inputs, and other industry-friendly policies that often harm people and the environment, but reduce business costs.

both incur extra manufacturing costs as their processes and product materials must change.¹⁰³ Company *A*, constantly checked by labor unions,¹⁰⁴ employee wage,¹⁰⁵ hour,¹⁰⁶ benefit,¹⁰⁷ and safety standards,¹⁰⁸ environmental regulation,¹⁰⁹ financial reporting requirements,¹¹⁰ using electricity or other fuels subject to cost-raising regulations,¹¹¹ cannot legally cut costs as easily as foreign company *B* who operates relatively free of constraint. With more latitude to cut financial corners, *B*'s five-star product would see a smaller rise in price than *A*'s product. Once foreign electronics (from company *B*) achieve the same "greenness" as American electronics (from company *A*), consumers may no longer pay higher prices for American products.¹¹²

3. Program Actors: Overregulation

Critics of EPR emphasize the high transaction costs associated with sorting electronics by brand, which could make EPR's design incentives unfeasible.¹¹³ However, these critics fail to account for at least one ancillary benefit of cumbersome EPR program logistics: costly recycling programs encourage manufacturers to privatize the program. In other words, manufacturers will do it themselves if they think they can do it more efficiently than municipalities and other program actors. Given most manufacturers' superior resources and competitive motivation, manufacturer programs are desirable, as they would remove program burdens from less willing and less capable actors, and place them onto manufacturers with a large stake in the program's efficiency. States already recognize these benefits as nearly every EPR statute encourages¹¹⁴ or requires¹¹⁵ manufacturers to establish private recycling programs.

¹⁰³ Kaplan, *supra* note 99.

¹⁰⁴ See, e.g., National Labor Relations Act of 1935, 29 U.S.C. §§ 151 *et seq.* (2006) (guaranteeing the right of employees to organize, form unions, and bargain collectively with their employers).

¹⁰⁵ See, e.g., Fair Labor Standards Act of 1938, 29 U.S.C. §§ 201 *et seq.* (2006) (federal minimum wage standards).

¹⁰⁶ See, e.g., *id.*

¹⁰⁷ See, e.g., An Act Providing Access to Affordable, Quality, Accountable Health Care, 2006 Mass. Acts ch. 58 (codified in scattered sections of MASS. GEN. LAWS ch. 176 (2008)).

¹⁰⁸ See, e.g., Occupational Health and Safety Act (OSHA) of 1970, 29 U.S.C. §§ 651 *et seq.* (2006).

¹⁰⁹ See, e.g., Clean Air Act, 42 U.S.C. §§ 7401 *et seq.* (2006) (providing technology-based emissions standards).

¹¹⁰ See, e.g., Sarbanes-Oxley Act of 2002, Pub. L. No. 107-204, 116 Stat. 745 (2002) (codified in scattered sections of 11, 15, 18, 28, and 29 U.S.C.).

¹¹¹ See, e.g., Clean Air Act §§ 7401 *et seq.*

¹¹² Of course this further assumes that "green" demanding consumers either do not care or do not know about foreign producers' externalities during the manufacturing process.

¹¹³ See, e.g., Sachs, *supra* note 23, at 75-80.

¹¹⁴ E.g., CONN. GEN. STAT. § 22a-631(e) (2008).

¹¹⁵ E.g., N.C. GEN. STAT. § 130A-309.92(c) (2008).

Program inefficiencies may eventually motivate manufacturers to take over recycling efforts—leading to dramatically increased efficiency—but they cause unnecessary economic harm to manufacturers in the meantime. State selections of program actors exacerbate the administrative costs of e-waste recycling programs. Selected program actors represent the state’s best guess at which entities are best suited for given roles, but these actors may or may not be the best fit for their respectively designated roles. If the state incorrectly deems an entity best fit for a role, then the program achieves a sub-optimal level of efficiency, as a better option is left unutilized. For example, private garbage collectors, ubiquitous nonprofit donation centers, and retail locations may be ideally situated to collect e-waste at minimal cost. Maine preempts these options by imposing collection duties exclusively on municipalities, forcing them to either (1) develop collection programs, (2) incur the transaction costs of finding and negotiating an independent contractor to collect in their stead, or (3) not provide collection services to residents at all.¹¹⁶ No provision in Maine’s program indicates that third parties may lawfully provide collection services within the program, even when municipalities choose not to participate. State “guesses” at market optimization are often wrong, and add to efficiency concerns about EPR.

B. Limited Public Participation: Who, What, and How Much?

Narrowly circumscribed e-waste programs tend to understate the gravity of the problem discussed in the Introduction of this Article. To varying degrees, all state e-waste laws exclude many types of harmful electronic products, fail to account for large quantities of included electronics, and leave many classes of people without practical recycling options. While legislatures are free to legislate in small increments, the current e-waste crisis calls for bolder action.

Consumers are more likely to use programs with which they are familiar, and that accept a wide range of items for disposal.¹¹⁷ Programs accepting a circumscribed list of electronics—for example, computer monitors, but not computers,¹¹⁸ or televisions, but not VCRs¹¹⁹—are certain to deter even the best-intentioned electronics consumers. In addition to the annoyance of sorting through trash, consumers might simply be unable to remember which products are covered by the program, and quite reasonably so. After all, several years

¹¹⁶ ME. REV. STAT. ANN. tit. 38, § 1610(5)(A) (2008) (municipalities may choose whether or not to participate).

¹¹⁷ *But see* Sachs, *supra* note 23, at 93 (“A product policy targeting electronics need not be as sweeping as in the European Union, where the WEEE Directive encompasses many products that may have minimal environmental impacts, such as toys, hair dryers, power tools, and even electric fry pans. The United States should focus on the largest contributors to the waste disposal problem, such as televisions, information technology equipment, audio equipment, and cell phones.”).

¹¹⁸ CAL. PUB. RES. CODE § 42463 (West 2008).

¹¹⁹ R.I. GEN. LAWS § 23-24.10-3(2) (2008).

may pass from one e-waste recycling to the next. The “pick and choose” approach to e-waste recycling will especially vex a large number of early baby boomers and electronic-illiterates who already encounter difficulties when dealing with technological distinctions. These difficulties would inevitably result in stockpiling or illegal dumping.

Likewise, a program that includes only particular classes of people is unlikely to pervade the public consciousness and therefore will stimulate only modest participation.¹²⁰ Legal scholars have recognized the power of social norms to encourage not only obedience to law, but also desirable behavior in the absence of law (e.g. able bodied people offering seats to the elderly).¹²¹ Individuals gauge their own behavior in large part by what they perceive as the social consensus on a given issue.¹²² In one study, for example, researchers found that people were more likely to litter in a littered environment due to the apparent social acceptability of littering.¹²³ If e-waste recycling occurred at home, at the workplace, at church, at shopping centers, and elsewhere, participation in recycling programs would become as much a part of the electronics experience as purchasing the gadget in the first place. Repetition and constant exposure would serve to promote the appearance—whether true or not true—of a social consensus underlying electronics recycling.¹²⁴ Limiting program coverage to a few small classes of people, however, risks chilling participation even among the covered classes by failing to normalize electronics recycling.

Establishing the quantities to be recycled is a more delicate task. Programs with discretionary recycling targets of, say, 60% of particular covered products¹²⁵ are likely to face the same participation chilling effects discussed above. Additionally, legislators must seriously question whether modest recycling goals are consistent with legislative findings and goals. Illinois specifically notes, among other dangers that “must be managed,” the prevalence of lead and mercury in electronic products.¹²⁶ Surely, the legislature knew of the extreme dangers that even trace amounts of lead and mercury pose,¹²⁷ yet the statute sets forth calculations for determining a modest fraction of e-waste to be covered by the program.¹²⁸ A half-solution to an admittedly urgent e-waste

¹²⁰ *Supra* Part I.B.3.

¹²¹ See Richard H. McAdams, *The Origin, Development, and Regulation of Norms*, 96 MICH. L. REV. 338, 356-58 (1997); Michael P. Vandenberg, *Beyond Elegance: A Testable Typology of Social Norms in Corporate Environmental Compliance*, 22 STAN. ENVTL. L.J. 55, 72-75 (2003).

¹²² McAdams, *supra* note 121, at 356-58.

¹²³ Vandenberg, *supra* note 121, at 75 n.56 (citing Robert B. Cialdini et al., *A Focus Theory of Normative Conduct: Recycling the Concept of Norms to Reduce Littering in Public Places*, 58 J. PERSONALITY & SOC. PSYCHOL. 1015, 1015 (1990)).

¹²⁴ *Id.*

¹²⁵ MINN. STAT. § 115A.1314(1)(b)(2) (2008).

¹²⁶ 415 ILL. COMP. STAT. 150/5(a)(2) (2008).

¹²⁷ See *supra* notes 5-10 and accompanying text.

¹²⁸ 415 ILL. COMP. STAT. 150/15-17 (2008).

problem fails to treat the danger as one that “*must* be managed.”¹²⁹

The success of any recycling program for consumer goods depends on consumer participation. The surest way to chill program participation is to obscure it behind product, person, and quantity limitations.

C. Failure to Account for Personal Information and Metadata

Most state e-waste statutes fail to acknowledge the likely presence of confidential information in discarded electronic waste.¹³⁰ While widespread identity theft may be an unlikely result of recycling programs, consumer fear of identity theft could substantially hinder recycling efforts. If consumers remain uncomfortable with surrendering their electronics to collectors—whether by mandate¹³¹ or personal choice¹³²—broad participation is unlikely. Instead, people would likely channel e-waste to closets, landfills, and other places perceived to be out of reach of identity thieves.

D. Restricting Out-Of-State Waste: Dormant Commerce Clause or the “Black Hole”

All e-waste programs eliminate recycle fees at the time of product collection. Unfortunately, freebies attract free riders. As discussed in Part I.B.4, rather than pay upwards of twenty dollars to recycle electronics locally, many environmentally conscious consumers may choose to cross state borders to recycle e-waste free of charge. Thus, recycling programs could unintentionally function as “black holes” for e-waste, sucking garbage from neighbor states and artificially magnifying manufacturers’ burdens of doing business in e-waste collecting states.

“Black holes” in the EPR context pose a couple of problems. A small state can effectively thrust the recycling burden of an entire region onto producers. This raises questions of fairness to producers but, more importantly, it imposes substantial economic risks on e-waste collecting states. If a recycling program in state *A* carries the burden of a half-dozen participating states, then

¹²⁹ *Id.* at 150/5(a)(2) (emphasis added).

¹³⁰ Even when the existence of private information is acknowledged, no protection is provided. See TEX. HEALTH & SAFETY CODE ANN. § 361.963(a) (Vernon 2008) (“A consumer is responsible for any information in any form left on the consumer’s computer equipment”); MINN. STAT. § 115A.1318(2)(c) (2008) (“[A] recycler has no responsibility for any data that may be contained in a covered electronic device”). *But see* 415 ILL. COMP. STAT. 150/50(d)(15) (2008) (requiring the use of “industry-accepted procedures for the destruction or sanitization of data on hard drives and other data storage devices.”).

¹³¹ See, e.g., CONN. GEN. STAT. § 22a-636 (2008) (“[N]o person shall knowingly place a covered electronic device . . . in any solid waste facility.”).

¹³² See, e.g., TEX. HEALTH & SAFETY CODE ANN. § 361.963(b) (Vernon 2008) (imposing no obligation to participate in the program, but stating that “[a] consumer is *encouraged* to learn about recommended methods for recycling and reuse of computer equipment that has reached the end of its useful life.”) (emphasis added).

producers—who foot the bill under EPR—have a great incentive to leave state *A* completely. Ceasing to do business in state *A* would be the only way to avoid paying for the hyper-costly program.

To escape this “black hole” effect, states limit their programs to in-state generated waste.¹³³ Unfortunately, favoring in-state waste generators puts states between a rock and a hard place. The so-called dormant Commerce Clause reserves authority to regulate interstate commerce for Congress alone.¹³⁴ In the words of the Supreme Court, “[t]hough phrased as a grant of regulatory power to Congress, the Clause has long been understood to have a ‘negative’ aspect that denies the States the power unjustifiably to discriminate against or burden the interstate flow of articles of commerce.”¹³⁵ The majority of dormant Commerce Clause cases, not coincidentally, deal with the “flow of articles” found in the solid waste trade.¹³⁶

Oregon Waste provides a close analogy to the situations presented by state e-waste programs.¹³⁷ In that case, Oregon imposed a surcharge on solid waste generated out-of-state.¹³⁸ The Court held the law facially invalid under the dormant Commerce Clause because by its terms it treated in-state and out-of-state economic interests differently, benefitting the former and burdening the latter.¹³⁹ The law failed to overcome the facial presumption of invalidity by showing a legitimate state goal that could be achieved by no less discriminatory means.¹⁴⁰

Like the statute at issue in *Oregon Waste*, nearly all e-waste laws facially discriminate between in-state and out-of-state e-waste, forcing out-of-staters to pay their own way while providing free recycling to certain classes of in-state residents.¹⁴¹ Neither the *Oregon Waste* statute nor state e-waste recycling statutes prohibit out-of-state waste from being discarded or recycled, respectively, in the host state. Like Oregon’s statute, however, e-waste

¹³³ See *supra* Part I.B.4.

¹³⁴ U.S. CONST. art. I, § 8, cl. 3 (“[Congress shall have Power] To regulate Commerce . . . among the several States . . .”) (emphasis added). See *Or. Waste Sys., Inc v. Dep’t of Env’tl. Prot.*, 511 U.S. 93, 98 (1994).

¹³⁵ *Oregon Waste*, 511 U.S. at 98.

¹³⁶ *Id.* Restricting interstate commerce seems more tempting when the objects of commerce, like garbage or other waste, are undesired by the state. Thus, the solid waste trade has served as the primary forum for Supreme Court dormant Commerce Clause jurisprudence. See *United Haulers Ass’n v. Oneida-Herkimer Solid Waste Mgmt. Auth.*, 550 U.S. 330 (2007); *C & A Carbone, Inc. v. Clarkstown*, 511 U.S. 383 (1994); *Fort Gratiot Sanitary Landfill, Inc. v. Mich. Dep’t of Natural Res.*, 504 U.S. 353 (1992); *Chem. Waste Mgmt. v. Hunt*, 504 U.S. 334 (1992); *Philadelphia v. New Jersey*, 437 U.S. 617 (1978).

¹³⁷ *Oregon Waste*, 511 U.S. at 98.

¹³⁸ *Id.* at 96.

¹³⁹ *Id.* at 99.

¹⁴⁰ *Maine v. Taylor*, 477 U.S. 131, 138 (1986).

¹⁴¹ *Supra* Part I.B.4.

recycling programs are disproportionately costly for out-of-staters.¹⁴² Essentially, e-waste programs exclude out-of-state waste from free recycling for the purpose of protecting in-state commerce—namely the in-state electronics manufacturers who foot the bill. This facial discrimination is precisely the “simple economic protectionism” that triggers a “virtually *per se* rule of invalidity” under dormant Commerce Clause jurisprudence.¹⁴³

Certain facially neutral state e-waste programs may also be vulnerable to a second dormant Commerce Clause attack. Facially neutral programs must pass the balancing test under *Pike v. Bruce Church, Inc.*¹⁴⁴ *Pike* requires facially neutral state regulation to (1) serve a legitimate local public interest, (2) have only incidental effect on interstate commerce, and (3) not impose a clearly excessive burden on interstate commerce in relation to the state’s asserted goal.¹⁴⁵ California and New Jersey’s e-waste programs require electronic products to comply with the European Union’s RoHS directive before those products may be sold at retail locations.¹⁴⁶ This requirement is probably facially neutral because it applies equally to in-state and out-of-state electronics manufacturers. However, conditioning manufacturers’ right to do business on compliance with unique state product design standards may constitute a “clearly excessive burden” as it would force interstate electronics manufacturers to create state-specific designs.¹⁴⁷ The cost of complying with a patchwork of different state design standards, like California’s and New Jersey’s RoHS standard, could significantly burden companies engaging in interstate commerce. Then again, the burden of compliance with the RoHS standard may be light, as major manufacturers already market RoHS compliant designs throughout Europe. Using those designs to comply with California and New Jersey e-waste requirements would not entail any redesign costs. If facially neutral e-waste laws are challenged as excessively burdensome on interstate commerce, it is far from clear what a court would decide.¹⁴⁸

¹⁴² Even relatively light burdens imposed on out-of-state waste may violate the dormant Commerce Clause. See *Fort Gratiot Sanitary Landfill, Inc. v. Mich. Dep’t of Natural Res.*, 504 U.S. 353 (1992) (striking down on dormant Commerce Clause grounds a state law banning disposal of out-of-county waste without a *permit*) (emphasis added).

¹⁴³ *United Haulers Ass’n v. Oneida-Herkimer Solid Waste Mgmt. Auth.*, 550 U.S. 330, 338 (2007) (quoting *Philadelphia v. New Jersey*, 437 U.S. 617, 624 (1978)).

¹⁴⁴ *Pike v. Bruce Church, Inc.*, 397 U.S. 137, 142 (1970).

¹⁴⁵ *Id.* (citing *Huron Cement Co. v. Detroit*, 362 U.S. 440, 443 (1960)).

¹⁴⁶ *Supra* notes 80-82.

¹⁴⁷ *Id.*

¹⁴⁸ Sachs, *supra* note 23, at 85.

III. PROPOSALS

A. Revitalizing EPR

1. Funding Mechanism: Individualized Fee Regime & Take Back Mandates

In nearly all states, collectors or recyclers already sort and weigh e-waste by brand to invoice the correct weight portions to manufacturers.¹⁴⁹ At virtually no extra expense, recyclers could keep electronics segregated by brand as they demanufacture and recycle e-waste.¹⁵⁰ Recyclers could record the actual costs of recycling each particular brand's products. Two relevant data sets would be available: (1) the total cost of recycling each individual manufacturer's e-waste, and (2) the total weight of each manufacturer's e-waste. One could divide total recycling cost by total weight to determine an individualized per-pound recycling fee. An individualized fee would allow manufacturers to absorb all the benefits of their green design investments, without performing any unremunerated favors for competitors.

Of course, the resulting fee would be specific to recycling costs only, and would exclude the costs of transporting, sorting, weighing, and other expenses appropriately represented by a uniform fee. A uniform per-pound base fee could cover these non-recycling costs. While all manufacturers would be subject to an identical base fee, they would reap innovation rewards through the individualized recycling fee.

For example, under the prior regime, when the recycling program costs an average of \$0.50 per pound, all manufacturers pay \$0.50 per pound. Under the individualized regime, each manufacturer is charged a unique fee. Let us assume the recyclers' data collection reveals that *A*'s products recycle at an average of \$0.20 per pound, *B*'s at \$0.30 per pound, and *C*'s at \$0.40 per pound. Let us also assume that base transportation, sorting, and weighing amount to \$0.20 per pound. We simply add the individualized recycle fee to the uniform base fee. So *A* pays \$0.40 (0.20 + 0.20) per pound, *B* pays \$0.50 (0.20 + 0.30) per pound, and *C* pays \$0.60 (0.20 + 0.40) per pound. *A* can offer a lower price to consumers for a greener product, while *C* rethinks its design in order to regain competitive footing.

However, the benefits of an individualized fee could be severely attenuated if the cost of recycling, compared with the rest of the program, were relatively slight. For instance, *A*'s recycling fee could be only \$0.05, *B*'s \$0.10, and *C*'s \$0.15, with a base fee of \$0.40. In that case, the one to three-cent per pound

¹⁴⁹ See R.I. GEN. LAWS § 23-24.10-11(a)(5) (2008); OR. REV. STAT. § 459A.340(4)(e) (2008); 415 ILL. COMP. STAT. 150/20(d)(1) (2008).

¹⁵⁰ *But see* Sachs, *supra* note 23, at 53 ("The transaction costs of implementing EPR . . . such as sorting particular product classes, or even particular brands, out of the general waste stream, are substantial and may outweigh the environmental benefits for many product classes.").

recyclability bonus might not entice companies to develop greener products. But then again, this depends on volume. If *A* pays for 1,000,000 pounds of recycled e-waste annually, then even pennies can break the bank.¹⁵¹

More concrete, state-specific program information is needed to put this fee calculation into practice. Prior to instituting an individualized fee regime, legislators should consider (1) the ratio of recycling costs to all other program costs, (2) the burden on recyclers of recycling each brand separately, and (3) the volume of e-waste passing through the program. Furthermore, a corrected EPR system does not speak to the broader question of whether achieving EPR's design incentives are worth the administrative costs and complexities associated with sorting and recording each manufacturer's products.¹⁵²

As an alternative to the individualized fee, states could simply condition manufacturers' right to do business in the state on manufacturers' taking back their own products for recycling.¹⁵³ Under a "take-back" mandate, manufacturers fully benefit from recyclability innovations, and the public pays little to administer the program.

This mandate, however, could create enormous costs for manufacturers who do not already possess the infrastructure to collect and recycle their electronics. They would have to outsource these jobs—essentially what the state would have done on their behalf under an individualized fee regime in which manufacturers reimburse third parties to do the work. The transaction costs associated with identifying and contracting third parties to execute the recycling program would be considerably more burdensome than merely funding a state-organized program.

Individualized and uniform fee programs allow manufacturers with the necessary infrastructure to opt out of state-organized programs by creating their own.¹⁵⁴ In contrast, mandatory take-back programs require manufacturer-organized programs from the start. The major difference between an individualized fee regime and a mandated manufacturer take-back program is that individualized fee regimes assume manufacturers lack recycling infrastructure, and mandated take-back programs assume manufacturers have operational recycling infrastructure.

The best funding model will depend on the relative positions of the electronics manufacturers doing business in a given state. If manufacturers are poised to operate their own recycling programs, then making them jump through

¹⁵¹ 1,000,000 pounds would represent 17% of electronics in the 2006 municipal solid waste stream. *Supra* note 4. Historic trends suggest that 1,000,000 pounds would represent a significantly smaller percentage of the waste stream today. *Id.*

¹⁵² Sachs, *supra* note 23, at 75-80 (criticizing the high administrative costs—product sorting and recording—of achieving EPR design incentives, advocating instead a program that simply keeps e-waste from entering landfills without attempting to alter design incentives).

¹⁵³ Texas and Michigan operate under this scheme. See TEX. HEALTH & SAFETY CODE ANN. § 361.955 (Vernon 2008); MICH. COMP. LAWS § 324.17309 (2008).

¹⁵⁴ N.J. STAT. ANN. § C.13:1E-99.103(d) (West 2009); CONN. GEN. STAT. § 22a-631(e) (2008).

hoops to opt out of another program serves no purpose. However, if manufacturers lack the infrastructure, a state-organized program could ease the transition to EPR.

2. Plugging “E-Waste Leakage”

Product “internalization” provided by an individualized fee or a producer take-back mandate would also help prevent a shift in consumer preference toward foreign electronics. If manufacturers internalized the true costs of recycling, toxic foreign products would jump significantly higher in price than their cleaner, American-made counterparts. For example, a \$5 foreign e-widget may cost \$2 to recycle because it is a veritable toxic bomb. A cleaner \$8 American e-widget may cost only \$1 to recycle. Absent the recycle program, the price disparity would be \$3 [$8 - 5 = 3$]. Under the recycle program, the disparity would shrink to \$2 [$(8+1) - (5+2) = 2$]. Therefore, individualized fees and take-back mandates mitigate price disparities by penalizing manufacturers in relation to their products’ actual recycling costs. This disfavors toxic overseas products. Foreign manufacturers would have to invest in green design merely to regain their previous footing. The pre-recycling-program price disparity between American and more toxic foreign electronics would be restored only when American products’ green advantage is neutralized, or in other words when foreign manufacturers develop an equally less toxic product. Unfortunately, foreign manufacturers could also conceivably restore pre-recycling-program price advantages by taking advantage of lax business regulations in their jurisdictions.¹⁵⁵

Making American and foreign products equally green would be good for American business and the environment. Green parity would not substantially affect consumer demand.¹⁵⁶ Foreign manufacturers would increase prices to cover initial green design investments without any substantive gains in product performance. If price and performance continue to drive consumer demand over recyclability,¹⁵⁷ then the effect of internalization would be twofold: encourage American business by disproportionately burdening overly-toxic foreign products, and encourage foreign green design investment to recover its previous price advantage. Both the environment and American business benefit.

3. Program Actors: Free Entry

When a recycling program uses existing infrastructure,¹⁵⁸ program costs are

¹⁵⁵ *Supra* Part.II.A.2. This issue must be remedied through international trade regulations, which are beyond the scope of this Article.

¹⁵⁶ *Supra* notes 101 and 112.

¹⁵⁷ *Supra* notes 101 and 112.

¹⁵⁸ See R.I. GEN. LAWS § 23-24.10-11(a)(1) (2008) (“[T]o the extent practicable, use existing local collection, transportation and recycling infrastructure.”); OR. REV. STAT. § 459A.340(4)(a)

streamlined. Certain entities may be better suited to act as collectors, processors, or recyclers, and efficient recycling programs should allow those entities to choose their role and level of involvement. Goodwill, for example, accepted 23 million pounds of electronics in 2004.¹⁵⁹ Other entities have varying levels of existing infrastructure that they could contribute. In addition, willing and able partners are preferable to those drafted into service. By dictating which entities will fill the necessary program roles, states preempt the recycling marketplace from making better selections, thereby sacrificing program efficiency.

By permitting any and all persons to register as collectors, processors, and recyclers, not only would the best-suited actors participate in the program, but free entry into the program would promote competition among actors. As barriers to entry diminish, recycling programs would become more attractive arenas for profit or public service. Competition would help drive up the quality of collection, processing, and recycling, while driving down unnecessary costs to manufacturers.

Finally, free entry preserves manufacturers' right to enter the program as single role actors or to create their own comprehensive programs if they can run more efficient operations. Free entry achieves this without torturing manufacturers with inefficiencies while they scramble to build recycling infrastructure.

Simultaneously with free entry for program actors, however, states must insure against total inaction. If no one enters the program, or if rural areas in particular fail to draw actors to fill the necessary roles, then other actors must step up. States therefore should follow New Jersey's recognition that municipalities provide the most logical last resort.¹⁶⁰ Nearly all consumers live reasonably close to one or more municipalities, and most municipalities have modest infrastructures to, at the least, collect e-waste for transport to better-equipped processors and recyclers.

Municipalities could serve as emergency actors in at least two ways. First, legislators could conscript municipalities into all necessary roles as a baseline, and permit them to contract out to willing actors. This approach provides a high degree of predictability and certainty for all actors. If a municipality were

(2008) ("[T]o the extent practicable, use existing local collection, transportation and recycling infrastructure."). Similar language is found elsewhere. TEX. HEALTH & SAFETY CODE ANN. § 361.955(e) (Vernon 2008) ("Collection services under this section may use existing collection and consolidation infrastructure for handling computer equipment . . .").

¹⁵⁹ *E-Waste: Can the Nation Handle Modern Refuse in the Digital Age?: Hearing Before the H. Comm. on Science and Technology*, 110th Cong. 19 (2008) (statement of Gerardo Castro, Director of Environmental Services and Contracts, Goodwill Industries of Southern California).

¹⁶⁰ N.J. STAT. ANN. § C.13:1E-99.16(a) (West 2009) ("Each municipality shall provide for a collection system for the recycling of [covered e-waste] . . . in those instances where a recycling collection system is not otherwise provided for by the generator or by the county, interlocal service agreement or joint service program, or other private or public recycling program operator.") (emphasis added).

ultimately obligated to fill a role, it would do so only after a long, fruitless search for a stand-in, so the municipality would have had ample time to prepare for the role. But this approach also places relatively heavy transaction costs on municipalities, as they must identify able partners and negotiate contracts.

Second, legislators could force municipalities into service only after a particular role is inadequately filled.¹⁶¹ Thus, the marketplace, rather than municipalities, would be responsible for filling program roles as a baseline. Registration would comprise a free-for-all up to a certain deadline, at which point municipalities would fill any roles yet unspoken for. If municipalities believed they could provide lower-cost service, then they would be free to register initially rather than waiting to take unoccupied program roles. This second approach avoids placing burdensome transaction costs on municipalities while ensuring the availability of collection, transportation, and recycling services.

Either version of the free-entry approach to determining who will carry out state recycling programs would prove more efficient than a centralized state-selection approach. The most important thing is to ensure that the best-suited actors participate in the program. E-waste recycling programs provide increased opportunity for profit, and therefore should attract participants through normal market forces. Free-entry removes unnecessary state interference.

B. *Invigorating Public Participation: Who, What, and How Much?*

State programs place limits on *who* may recycle *how much* of *what*. Overly exclusive e-waste programs, however, fail to satisfy a state's "duty to protect the health, safety and welfare . . . [, to] enhance and maintain the quality of the environment . . . and [to] prevent air, water and land pollution."¹⁶²

Consumers are more likely to use programs that accept all of the items they have for disposal. The European Union's e-waste collection program, established through the Waste Electrical and Electronic Equipment ("WEEE") Directive, encompasses everything from computers to hair dryers to power tools.¹⁶³ Certainly, many of the items covered by the WEEE Directive pose negligible threats to public health and the environment,¹⁶⁴ but their inclusion achieves something much greater. A broad scope of covered products supplies that magic element of *convenience*. Without it, public participation, even with

¹⁶¹ *Id.*

¹⁶² ME. REV. STAT. ANN. tit. 38, § 1610(1) (2008).

¹⁶³ Council Directive 2002/96, Waste Electrical and Electronic Equipment, 2003 O.J. (L 37) 24, 34-35 (EC).

¹⁶⁴ See Sachs, *supra* note 23, at 93 ("A product policy targeting electronics need not be as sweeping as in the European Union, where the WEEE Directive encompasses many products that may have minimal environmental impacts, such as toys, hair dryers, power tools, and even electric fry pans. The United States should focus on the largest contributors to the waste disposal problem, such as televisions, information technology equipment, audio equipment, and cell phones.").

regard to covered items, will remain sparse. States ought to follow the EU's lead, with legislation that covers not only obvious items like televisions, monitors, and computers, but also any product containing a circuit board, like cell phones, printers, and MP3 players—anything a typical consumer would consider “electronic.” Consumer expectations about e-waste must guide decisions about product inclusion, since convenience is paramount.

Furthermore, states should follow Connecticut's lead by granting agencies flexibility to add “any other similar or peripheral electronic device specified in regulations.”¹⁶⁵ The “similar or peripheral device” provision gives the administering agency the ability to expand or shrink the recycling program by adjusting the scope of covered products. Such flexibility is necessary given the remarkable rate of growth and change in the electronics industry, and the inherent uncertainties of cost and public response in any new program. Consumers' ability to drop off any and all electronics ensures vigorous public participation.

Programs must be accessible to all classes. All people, businesses, government bodies, and schools should be able to recycle their e-waste. As discussed in Part II.B, program participation by many would help construct social expectations regarding e-waste.¹⁶⁶ At the very least, one who recycles electronics at work and at home, and watches others do the same, would be less likely to unwittingly throw defunct headphones into the garbage at a third location. Inclusion of all classes would enable e-waste recycling to enjoy greater public visibility and normative effect, both of which would help foment vigorous participation.

The quantities of covered products eligible for free recycling should reflect the urgency of the e-waste problem. Legislatures need to be honest with themselves and their constituents by passing e-waste programs that address the problems identified in the laws' preambles.¹⁶⁷ Legislators should not slap high-fives for modestly reducing the number of mercury-filled LCD screens in landfills. If a few drops of mercury can poison a lake, then it behooves legislators to do one better than simply preserving moderate mercury levels in groundwater.¹⁶⁸ Quantity limits on covered e-waste leave consumers stuck with the decision of paying to recycle e-waste or discarding it free of charge. To maintain robust participation, consumers cannot face this choice. Recycling programs ought to place landfill bans on all major covered electronic products (televisions, monitors, computers), and collect all minor electronics (headphones, hairdryers, power drills) free of charge to the consumer. With a straight ban, larger, more dangerous items are less likely to be haphazardly discarded, and the smaller innocuous items may still be collected as part of a

¹⁶⁵ CONN. GEN. STAT. § 22a-629 (2008).

¹⁶⁶ See Vandenberg, *supra* note 121, at 72-75.

¹⁶⁷ See *supra* Part II.B.

¹⁶⁸ See *supra* note 10 and accompanying text.

comprehensive and convenient electronics recycling program.

Concern for overburdening electronics manufacturers led states to limit the scope of programs to include only particular product types and quantities, and classes of people. An Illinois study found that a statewide recycling program would create 4,000 new jobs and \$740 million in annual receipts.¹⁶⁹ But these economic gains would be roughly proportionate to the losses experienced by manufacturers who paid program costs. Hard choices must be made. If legislatures commit themselves to an EPR scheme, in which manufacturers pay program costs, legislatures cannot also engage in manufacturer protectionism. If legislatures cannot achieve an adequately robust and accessible recycling program with manufacturer funding, then they should consider an ARF scheme. Under ARF, in which program costs are spread across all consumers at the point of purchase, there is every reason to open program doors to as many products and people as possible.

Electronic waste recycling programs ought to state in the broadest possible terms *who can recycle how much of what*. Program limitations chill public participation and fail to serve the goals of e-waste legislation.

C. *Personal Information and Metadata: Somewhere Between Texas and Illinois*

Electronics entering e-waste programs are either demanufactured into raw materials, or refurbished for reuse.¹⁷⁰ Electronics demanufactured into metal, glass, and plastic can tell none of the personal secrets they once contained. The public may worry, however, about refurbished electronics intended for reuse. Even in the absence of a high risk for identity theft, states' failure to account for personal information contained in reusable electronics may, again, substantially chill public participation. Comprehensive data sanitization may be overkill and unnecessarily costly for states, but silence on the matter may cause public anxiety to flourish. One solution lies somewhere between the data sanitation policies of Illinois and Texas.

Illinois requires refurbishers to "employ industry-accepted procedures for the . . . sanitization of data . . ."¹⁷¹ The statute then presents the National Institute of Standards and Technology's Guidelines for Media Sanitization as an acceptable guideline for industry practice.¹⁷² Those Guidelines say that electronic media ought to be "sanitized in a manner [] commensurate with the confidentiality of its information"¹⁷³ and that "[t]he cost versus benefit of a

¹⁶⁹ 415 ILL. COMP. STAT. 150/5(a)(6) (2008).

¹⁷⁰ *E.g.*, *id.* at 150/50(d)(13).

¹⁷¹ *Id.* at 150/50(d)(15).

¹⁷² *Id.*

¹⁷³ NAT'L INST. OF STANDARDS & TECH., GUIDELINES FOR MEDIA SANITIZATION 5 (2006) available at http://csrc.nist.gov/publications/nistpubs/800-88/NISTSP800-88_rev1.pdf.

media sanitization process should be understood prior to a final decision.”¹⁷⁴ Given the relatively innocuous information in most electronics, refurbishers would do very little to sanitize data. A select few e-waste items—e.g., corporate, business, or government-owned computers—may require more expensive sanitization for safe reuse.

Illinois’s approach contrasts sharply with Texas’s approach. Texas warns that “[a] consumer is responsible for any information in any form left on the consumer’s computer equipment”¹⁷⁵ Texas saves on administrative costs, but leaves no remedy for nervous consumers. Public fear may render such a recycling program ineffective.

When Illinoisan paternalism meets Texan self-help, we get a third approach. Rather than run all computers and other electronics through data sanitization procedures, states should place the onus on consumers to request sanitization for particular items. A sanitization request could occur at the point of collection by conspicuously placing a specified sticker or mark on the item. Any manner of identifying the item would suffice. Thus, an unmarked computer may pass through without sanitization, while an identical, marked, computer would undergo sanitization. In other words, all collected items are presumed to be sanitized unless otherwise noted. Only consumers know how, and for what, their electronic items were used, so the decision to sanitize should rest with them. Under this hybrid approach, state programs avoid the unnecessary costs of sanitizing items that cause no concern or danger to consumers, and expend resources to sanitize only items that consumers worry about.

One objection to this approach might be that placing a mark on “confidential” items could raise a flag for information thieves. However, handlers of the marked e-waste are bound by statute to execute industry-standard sanitization procedures upon request. The threat of liability would encourage self-policing in the refurbishing process. Furthermore, end re-users would have no reason to scavenge their refurbished machines for personal information since the sanitization-request marking would, of course, be removed prior to distribution for reuse.

Texas-Illinois hybrid sanitization would preserve a public perception of information security. Those concerned about personal information would have assurance of sanitization, but the state would not incur the sanitization costs for those who are unconcerned about the data on their e-waste. This approach strengthens public confidence, and streamlines program costs.

¹⁷⁴ *Id.* at 9.

¹⁷⁵ TEX. HEALTH & SAFETY CODE ANN. § 361.963(a) (Vernon 2008). *See also* MINN. STAT. § 115A.1318(2)(c) (2008) (“[A] recycler has no responsibility for any data that may be contained in a covered electronic device”).

D. *The Dormant Commerce Clause or the “Black Hole”?*

States must tread an impossible tightrope to achieve e-waste recycling goals without encroaching upon Congress’s exclusive authority to regulate interstate commerce.¹⁷⁶ As states ponder whether to face the dormant Commerce Clause or the “black hole” effect, they will likely find the “black hole” a weaker foe.

Electronic waste laws facially discriminate against out-of-state waste, and are likely vulnerable to invalidation.¹⁷⁷ One might argue that e-waste programs do not favor in-state commerce at all. Rather, they burden in-state electronics manufacturers, and discriminating against out-of-state waste serves as the only means of limiting that burden to a manageable size while pursuing a legitimate goal.¹⁷⁸ Given the right fact pattern, this justification could conceivably overcome “rigorous scrutiny”¹⁷⁹ to rebut the presumption of invalidity. More likely, however, a court would doom e-waste programs based on “simple economic protectionism” as discussed in Part II.D of this Article. So while it is conceivable for a facially discriminatory state e-waste law to rebut a presumption of invalidity, legislatures would do better to avoid facial discrimination altogether, especially considering the Supreme Court’s disposition toward facial discrimination in dormant Commerce Clause jurisprudence.¹⁸⁰

If states remove e-waste discrimination, however, coverage for in-state consumers would extend to out-of-state consumers. For example, Maine’s coverage of household-generated e-waste would necessarily extend to all household e-waste in the other forty-nine states.¹⁸¹ Manufacturers would likely leave Maine if staying there required them to recycle multiple states’ e-waste. But the “black hole” may pose a weaker threat than first appears. Nineteen states have passed electronic waste recycling programs and many other states are considering similar bills in 2009.¹⁸² As programs become more numerous, the smaller the vacuum effect on each program. Rather than cross borders to recycle e-waste, consumers will use their local programs.

¹⁷⁶ U.S. CONST. art. I, § 8, cl. 3 (“[Congress shall have Power] To regulate Commerce . . . among the several States . . .”). See discussion *supra* Part II.D.

¹⁷⁷ See discussion *supra* Part II.D.

¹⁷⁸ See *Maine v. Taylor*, 477 U.S. 131, 138 (1986).

¹⁷⁹ See *C & A Carbone, Inc. v. Clarkstown*, 511 U.S. 383, 392 (1994) (Discrimination is *per se* invalid “save in a narrow class of cases in which the municipality can demonstrate, under *rigorous scrutiny*, that it has no other means to advance a legitimate local interest.” (emphasis added)).

¹⁸⁰ *Or. Waste Sys., Inc v. Dep’t of Env’tl. Prot.* 511 U.S. 93, 101 (1994) (“The State’s burden of justification is so heavy that ‘facial discrimination by itself may be a fatal defect.’” (quoting *Hughes v. Oklahoma*, 441 U.S. 322, 337 (1979))).

¹⁸¹ ME. REV. STAT. ANN. tit. 38, at § 1610(5)(B)(1) (2008).

¹⁸² H.B. 1589, 116th Gen. Assem., 1st Reg. Sess. (Ind. 2009); S.B. 63, 2009 Leg., Reg. Sess. (Ky. 2009); S.B. 364, 95th Gen. Ass., 1st Reg. Sess. (Mo. 2009); L.B. 644, 101st Leg., 1st Reg. Sess. (Neb. 2009); S.B. 2512, 231st Leg., Reg. Sess. (N.Y. 2009); H.B. 409, 193d Gen. Ass., Reg. Sess. (Pa. 2009); S.B. 131, 118th Gen. Ass., 1st Reg. Sess. (S.C. 2009) (Advanced Recovery Fee approach); S.B. 77, 2009 Leg. Sess. (Vt. 2009); S.B. 107, 99th Leg., Reg. Sess. (Wis. 2009).

States should lobby for electronic waste legislation in neighboring states, and amend their own e-waste statutes by striking the discriminatory provisions. Better yet, states should wait for ambitious litigants to invalidate e-waste discrimination in court. Waiting for litigation would buy time for neighboring states to pass e-waste legislation. Alternatively or concurrently, states should press Congress for action on e-waste. While this approach is somewhat unsatisfying given the difficulties in changing other jurisdictions' behavior, states must pick their poison: dormant Commerce Clause or the "black hole." The suggested approach acknowledges that states stand a better chance pressing for new e-waste legislation than they have defending against dormant Commerce Clause challenges in court.

Similarly, the second dormant Commerce Clause attack—a facially neutral product requirement that imposes a clearly excessive burden on interstate commerce¹⁸³—can be neutralized by strength in numbers. As discussed in Part II.D, California and New Jersey risk dormant Commerce Clause attack by requiring manufacturers to eliminate certain toxins in their products in accordance with the RoHS Directive. To mitigate burdens on interstate commerce, states should push others to enact the same or a similar standard. As unique product standards become more common, the burden to produce multiple designs for the same product lessens. In both dormant Commerce Clause challenges, states ought to seek greater uniformity with surrounding states.

CONCLUSION

Electronic waste can be dangerous when the time arrives for its disposal. As electronics become increasingly pervasive in American life, states have begun to recognize the environmental and public health damage that will occur if e-waste is allowed to accumulate in landfills. In the absence of federal protection, more than a dozen and a half states have created electronic recycling programs within the last several years. In fact, states are churning out major new programs almost monthly.¹⁸⁴ Despite the best intentions, however, these programs appear to be hastily made and poorly considered on many points of policy and law.

EPR recycling programs, in which manufacturers pay the costs, must change from the current uniform fee system to an individualized fee system or manufacturer take-back mandates. Individualized fees and take-back mandates capture the green design incentives of EPR by rewarding manufacturers, and only those manufacturers, who make the design investments.¹⁸⁵ Furthermore, individualized fees and take-back mandates would close price gaps between

¹⁸³ See *Pike v. Bruce Church, Inc.*, 397 U.S. 137, 142 (1970). See also discussion *supra* Part II.D.

¹⁸⁴ Electronics TakeBack Coalition, *supra* note 21, *States Summary 2009* (ten states created e-waste programs in 2008 alone).

¹⁸⁵ *Supra* Part III.A.I.

inexpensive, toxic products and more expensive, nontoxic products.¹⁸⁶

Electronic waste programs should also remove the host of restrictions that harm efficiency and chill participation. Barriers to entry should be minimized for prospective program actors—collectors, processors, and recyclers.¹⁸⁷ Open access increases competition for program dollars and ensures that the best-suited entities provide the most efficient service, thereby minimizing overall program costs. Restrictions on *who* may recycle *how much* of *what* should be minimized to reflect the urgency of the e-waste crisis and promote vigorous public participation.¹⁸⁸

Vigorous public participation can also be encouraged by shaping consumers' perception of safety. Lawmakers should consider synthesizing Texas's and Illinois's approaches to dealing with confidential information contained in e-waste. The hybrid consumer request system would minimize costs while ensuring consumer confidence in the program.¹⁸⁹

Nearly all state e-waste laws are vulnerable to dormant Commerce Clause attack. To avoid invalidation without becoming a "black hole" for neighbor states' e-waste, states should lobby for federal and state action. As more jurisdictions enact electronic recycling programs and product standards like the RoHS Directive, burdens on interstate commerce will grow lighter and imports of neighbor states' e-waste will decrease.¹⁹⁰

2009 will be another prolific year for e-waste legislation. One would expect e-waste legislation to have matured over the course of creating nineteen state programs. In reality, however, existing programs appear to be cut from the same mold and riddled with the same flaws. Progress is painfully slow, and time is short; to ensure that technology continues to improve our lives, without threatening public health and the environment, legislatures must steepen the e-waste learning curve.

¹⁸⁶ *Supra* Part III.A.2.

¹⁸⁷ *Supra* Part III.A.3.

¹⁸⁸ *Supra* Part III.B.

¹⁸⁹ *Supra* Part III.C.

¹⁹⁰ *Supra* Part III.D.