



# A Study of the State-by-State E-Waste Patchwork

*An analysis of its economic  
and other effects on industry,  
government and consumers*

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## Executive Summary

The evolving patchwork of differing state-level electronics recycling mandates results in several quantifiable costs to public and private sector entities that would not exist with the introduction of a national electronics recycling program. Drawing from cost estimates provided by principal public and private sector entities in state electronics recycling programs, this study identifies and quantifies estimates of these “dead weight” costs with the following results:

- Recurring dead weight of 4 existing state-legislated programs:

**\$25 million/year**

- Average one-time dead weight costs per state:

**\$2.9 million**

- Recurring dead weight potential with 20 differing state programs:

**\$125 million/year**

### *Acknowledgments*

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## Introduction

An assumption articulated by different stakeholders involved in the development of electronics recycling systems is the assumed extra burden created by multiple state programs in comparison with a national approach. This assumption was cited repeatedly in the recently released report from the U.S. Commerce Department,<sup>1</sup> noted by private sector policy positions<sup>2</sup>, cited by Members of Congress<sup>3</sup>, and has even been articulated in multiple conference proceedings by officials implementing state programs. To date, however, no one has attempted to isolate and quantify this assumed state patchwork burden, thus creating uncertainty about the size and scale of such a burden – or whether it even actually exists. This study attempts to answer these questions.

As a step towards understanding the effects of multiple states enacting differing, independent electronics recycling systems, the National Center for Electronics Recycling (NCER) authors this study under the National Electronics Recycling Infrastructure Clearinghouse (NERIC) initiative. This study attempts to identify and quantify the existing and potential effects of ever-expanding state-level electronics recycling requirements. This study does not address the inherent benefits or drawbacks of any of the mandatory approaches, only the effects of the state patchwork approach on different stakeholders. This study also does not analyze the potential dead weight of harmonized programs implemented across multiple states, which could reduce dead weight costs to some extent. Nor does this study advocate the passage or defeat of any proposed legislation at the state or federal level. The study does analyze the effect of legislation already passed and enacted in the 4 mandatory state programs to date – California, Maine, Maryland, and Washington – and estimates the economic effect of additional programs potentially enacted during the next few years.

**“To date, however, no one has attempted to isolate and quantify this assumed state patchwork burden.”**

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1 “Recycling Technology Products: An Overview of E-Waste Policy Issues” was published by the Department of Commerce, Technology Administration, Office of Technology Policy in July 2006. From page 3: “The cost of compliance for industry with any one law can be challenging. But industry is now facing a patchwork of international and state laws that can dramatically affect the manufacture, marketing, and business models of the U.S. electronics sector and the transaction costs and business models of our retail sector. Disparate requirements can lead to uncertainties, inefficiencies and high compliance costs that could impede U.S. industry’s ability to compete and innovate.”

2 Testimony from the Consumer Electronics Association before the United States House of Representatives Committee on Energy and Commerce Subcommittee on Environment and Hazardous Materials on September 8, 2005: “The current de-facto framework is an evolving patchwork of state-by-state approaches. As this Subcommittee is aware, three states, California, Maine and Maryland, have passed legislation to manage used electronics. These inconsistent state requirements likely will soon be joined by even more conflicting state requirements, as there were over twenty-five states that introduced legislation on the subject in 2005. This conflicting, ad-hoc approach imposes unnecessary burdens on global technology companies and consumers alike. Electronics recycling is a national issue that warrants a national solution.”

3 See Congressional E-Waste Working Group news release: “However, rather than having a patchwork of state regulations and individual company policies, a federal solution may be a more effective approach” at <http://mikethompson.house.gov/newsroom/index.asp?ID=94>.

## Summary of Study Methodology

The first step in development of this study was the identification of the primary aspects of the patchwork system that potentially cause the costs to be higher than would otherwise be the case under a comprehensive national system (i.e., what we are calling the cost “drivers”). These cost drivers were separated into two basic categories. The first category, which ultimately proved easier to quantify, focuses on increases in Administrative and Compliance costs associated with the multiple state programs. The second category of costs is presented on a qualified basis and includes the higher per unit Materials Handling and Processing Costs attributable to having only some states impose recycling requirements versus the economies of scale that would be realized under a national system. For purposes of identifying whether a state patchwork or single national electronics recycling system would incur higher costs, the study assumed a set of generic characteristics as shown in Part 3. Each cost driver was analyzed in relation to a hypothetical national program, and costs that clearly would not exist in a single national program are called “dead weight” costs.<sup>4</sup> Where costs or cost savings were not clearly supported by collected data, discussion of these costs were either removed from the study or presented only on a qualified basis.

Aside from overall system costs driven higher by a state patchwork approach, this study also identified additional factors that create potential inequities in the programs. Equity or “fairness” issues do not directly affect bottom line program costs<sup>5</sup>, but program compliance is likely to decline and enforcement costs rise if certain stakeholders perceive these inequities. These patchwork inequities are presented on a qualified basis at the end of Part 2 of this report.

Finally this study collected data from numerous primary sources to quantify the costs wherever possible. Drawing from actual costs reported by corporations complying with existing programs and government officials responsible for state program implementation, estimates of each cost driver were developed, totaled and analyzed to produce a best estimate of the dead weight costs associated with the patchwork of current and projected future programs.

For each cost driver, costs are provided in the following categories:

- *Direct Labor*. For purposes of this study direct labor costs are assumed to be all employers’ personnel expenses dedicated to performing tasks attributable to that employer’s primary mission (e.g., recycling electronics, administering a government program, etc.).
- *General and Administrative (G&A)* costs are any management, financial, and other expense for the general management and administration of the company or agency as a whole. G&A costs also include expenses typically provided by outside parties (legal and accounting services, monitoring and reporting services, printing materials, etc.).
- *Capital Investments* are costs supporting the acquisition or development of property or other long-term asset (e.g., information systems, spare plant and equipment, etc.)

<sup>4</sup> Note that such dead weight costs would be at least an order of magnitude higher if mandatory e-waste programs were enacted at the local level instead of the state level. This study did not calculate the dead weight costs of hundreds (potentially thousands) of localities each establishing services and programs, changing ordinances, trying to work with the local and national retailers/manufacturers, etc. but the dead weight costs of a locality-based patchwork would be significantly higher than the state patchwork costs that are the subject of this study.

<sup>5</sup> Theoretically this inequity could affect bottom-line costs if some party had a comparative advantage (e.g., if retailers were better at something than one of the other involved parties). No example in the electronics recycling industry was identified in this study.

Given the lack of data for all identified cost drivers, this study has not quantified all the direct labor, overhead, and capital investments associated with each of the cost drivers. Where it was not possible to come up with firm estimates of the costs, this study identified the likely types of impacts and their relative significance (e.g., possible price reductions in processing costs attributable to processing economies of scale resulting from national-scale volumes of e-waste).

## Summary of Total Dead Weight Patchwork Costs

**Table 1** summarizes dead weight costs by stakeholder. This table includes a summary of annual dead weight costs associated with the existing 4-state mandated programs once all 4 programs are fully implemented (i.e., 2009). By averaging the one-time and recurring costs associated with these 4 state programs, this table also estimates the one-time and annual (recurring) dead weight cost per year for each new state enacting electronics recycling mandates.

<b>Table 1: Current Dead Weight Costs</b>			
	<i>4 State Recurring Dead Weight (status quo)</i>	<i>One-Time Dead Weight per New State Program</i>	<i>Annual Dead Weight per New State Program</i>
<i>Manufacturers</i>	\$8,159,200	\$482,245	\$2,039,800
<i>Retailers</i>	\$3,237,586	\$1,639,875	\$809,397
<i>Collectors/recyclers</i>	\$9,270,500	\$0	\$2,317,625
<i>Government</i>	\$4,380,000	\$813,750	\$1,095,000
<b>TOTAL</b>	<b>\$25,047,286</b>	<b>\$2,935,870</b>	<b>\$6,261,822</b>

By extrapolating on the recent rate of 1 new state mandate per year, **Table 2** projects the stakeholder-specific dead weight costs to be incurred through 2012 assuming that one new state mandated program is implemented in 2010 and another in 2011. Table 2 also projects annual dead weight costs of a hypothetical “mega-patchwork” of 20 different state programs based on an extrapolation of current costs and trends.

<b>Table 2: Projected Dead Weight Costs</b>		
	<i>Cumulative Dead Weight Costs Projected 2004-2012</i>	<i>Hypothetical 20-State “Mega-Patchwork:” Projected Annual Dead Weight Costs</i>
<i>Manufacturers</i>	\$70,206,870	\$40,796,000
<i>Retailers</i>	\$36,549,338	\$16,187,932
<i>Collectors/recyclers</i>	\$76,481,625	\$46,352,500
<i>Government</i>	\$41,017,500	\$21,900,000
<b>TOTAL</b>	<b>\$224,255,333</b>	<b>\$125,236,432</b>

**Table 3** summarizes the dead weight costs shown in first column of Table 1 by cost driver. These are the recurring status quo dead weight costs associated with the 4 states that have enacted mandates to date.

<b>Table 3: Dead Weight by Cost Driver</b>			
	<b>Recurring Costs Across All Stakeholders</b>	<i>Amount of Recurring Costs Direct Labor</i>	<i>Amount of Recurring Costs General &amp; Administrative</i>
1. Policing & excluding out-of-state wastes	<b>\$10,022,550</b>	<i>\$1,000,000</i>	<i>\$9,022,550</i>
2. Manufacturer/retailer compliance (e.g., redundant and conflicting information requirements, start-ups)	<b>\$3,654,286</b>	<i>\$0</i>	<i>\$3,654,286</i>
3. Redundant system administrations	<b>\$2,530,000</b>	<i>\$2,380,000</i>	<i>\$150,000</i>
4. Redundant state program development engagements	<b>\$8,840,450</b>	<i>\$0</i>	<i>\$8,840,450</i>
<b>TOTAL</b>	<b>\$25,047,286</b>	<b><i>\$3,380,000</i></b>	<b><i>\$21,667,286</i></b>

## **Part 1: Overview of Existing State Programs**

Since 2001 there has been a flurry of activity at the state level on many levels, from voluntary programs to the passage of mandatory legislation. The mandatory programs have received the most attention primarily due to the contentious legislative battles that play out regarding who pays, and how much. Each of the 4 existing state-mandated programs in the U.S. is summarized below.

In 2003, California was the first state to enact a law creating a statewide program that is financed by an advanced recycling fee (ARF) of \$6, \$8, or \$10 paid by the consumer at the point of sale on certain computer monitors, TVs, and laptop computers. The revenue generated by the ARF goes into a state fund that is then used to pay qualified collectors and recyclers for used products received from California businesses, households and institutions.

The Maine program covers TVs, computer monitors and laptop computers under a law passed in 2004. However, under Maine's approach, the funding for the system is the responsibility of product manufacturers once local governments have collected products from Maine households and delivered them to state-approved "consolidators." These consolidators count the number of brands from each manufacturer, and then send each manufacturer a bill for the amount that their brands represent plus an additional amount for "orphan" products whose original manufacturer no longer exists and no successor can be found by the Maine Department of Environmental Protection.

Maryland also passed a law in 2004 that sets up a five-year pilot program for recycling desktop computers, laptops, and computer monitors from any source (business, household, institutional). Under the program, manufacturers of these products must register with the State and pay an annual \$5,000 fee. If the manufacturer implements a take-back program, the fee is reduced to \$500 after the first year. The collected registration fees go into a state recycling trust fund that can be used by local governments to fund collection and recycling programs.

The most recent mandatory electronics recycling program was enacted in Washington State in March, 2006. Washington State's program is yet another approach in which manufacturers are assigned complete financial responsibility for collecting and recycling desktop computers, laptops, televisions and computer monitors generated by households, small businesses, small governments, charities and school systems. By state law, manufacturers fulfill their obligations through participation in a mandatory state-created authority, or through independent plans approved by the state meeting specific legislated criteria. Decisions about whether manufacturers will pay based on their share of returned brands or on new product sales – or some combination – will be made by the authority's board of directors prior to full program implementation in January, 2009.

## Part 2: Cost Detail

### Patchwork Administrative and Compliance Costs

This study identified 4 unique cost drivers of increased administrative and compliance costs potentially due to the state patchwork of e-waste mandates. Cost drivers that have quantified estimates are presented first, followed by “softer” cost drivers for which quantified estimates are not possible or no data were available. Each cost driver was then analyzed to identify dead weight costs for manufacturers, retailers, collectors/recyclers, and government – i.e., costs resulting from state programs that would not exist in a hypothetical national program.

#### *Cost Driver #1: Policing and Excluding Out-of-State Wastes*

A common characteristic of state mandatory e-waste programs is the need to exclude out-of-state electronics from entering that state’s recycling program. Different states are trying different approaches to ensure collection and processing of only in-state returns. For example, California requires non-municipal collectors to collect and report generator-specific data collected from consumers dropping off used electronics, while Maine requires that municipal collectors distinguish between generation of electronics by Maine households from other sources (e.g., collectors mark the letters “MH” on each collected covered device to comply with this requirement to indicate which electronics were generated by Maine households).

**“A common characteristic of state mandatory e-waste programs is the need to exclude out-of-state electronics from entering that state’s recycling program.”**

Since a national system would not differentiate or track the state where specific e-waste was generated, all costs expended by stakeholders for this cost driver are assumed dead weight for the purposes of this study. While it is possible that a national system might include restrictions for importation of used electronics from other countries, costs for policing small amounts from Mexico and Canada (where comprehensive recycling programs are under development) are assumed negligible.



### *Cost to Manufacturers*

In Maine's program, manufacturers are responsible for paying consolidation (not collection) and recycling costs documented on invoices from state-approved consolidators that received e-waste from in-state collection programs. Thus a manufacturer who wishes to confirm the source of e-waste for which it was billed as truly from Maine households would investigate and challenge consolidator invoices thought to include wastes from out-of-state. *Cost Type: General and Administrative @ \$122,500, 100% dead weight*

### *Cost to Collectors/Recyclers*

Collectors in California and Maine must comply with documentation requirements to ensure that e-waste comes from within state borders.

- In Maine, consolidators are supposed to reject wastes not appropriately documented or marked as from a Maine household source. At an April, 2006 meeting, Maine's active consolidator Uniwaste stated that this has not yet been a significant cost issue for them. This may change if there are challenges from manufacturers about conformance with Maine's in-state requirements
- In California collectors are required to document that the generator source was from California (e.g., all non-municipal collectors are required to record and report the name and address of each "consumer" – defined in California as a household, business or institution – that turns in a Covered Electronic Device for recycling).

*Cost Type: General and Administrative @ \$8.9 million, 100% dead weight*

### *Cost to Government*

Maine and California have both developed regulations to ensure out-of-state wastes are not financed by their respective state systems (regulatory development costs are shown under Cost Driver #2). California officials also have the extra responsibility of reviewing documentation provided by collectors to confirm waste as in-state, to reject claims not satisfying reporting requirements, and to process appeals of rejected claims. *Cost Type: Direct Labor @ \$1 million, 100% dead weight*

### *Effects on Consumers*

Beyond the higher system administrative costs ultimately paid for by consumers that are caused by this cost driver, consumers may also suffer from confusion about program coverage of electronics purchased in another state and transferred into a state with a program. Although this study did not quantify these costs, some number of additional consumer queries on this point to government officials, retailers and collectors would be expected. Confusion about state program participation could be elevated in communities located along borders of states without a corresponding electronics collection program.

***Cost Driver #2: Multi-State Manufacturer & Retailer Compliance (e.g., Information Reporting Requirements, “Rolling Start-up” Costs)***

*Cost to Industry*

The patchwork has resulted in differing state compliance requirements on industry, including:

- Retailer notification (California)
- “Do not sell” retailer requirements (Maine, Maryland, Washington)
- Identification of in-scope products (Maine, Maryland, Washington, California). Note that the scope of covered products is different in all four states.
- Manufacturer registration requirements (all four states)
- Reporting requirements (all four states), including ARF reporting in California

The 4 existing state e-waste statutes are peppered with these and other compliance requirements, including ongoing reporting requirements for manufacturers, retailers, collectors and recyclers. These reporting requirements are sometimes intertwined with registration requirements. Data required runs the gamut, including estimates of the number of covered electronic devices sold into the state (California, Maine), amounts of specific compounds used in those products (California), and the total volume collected and recycled in that state during the previous year (Washington).

Compounding the challenge of multiple and varying information requirements, state program implementation is not concurrent and occurs over multiple years with ever-changing compliance requirements. Unlike a typical national recycling system model multiple state e-waste programs constitute a “rolling start-up” in which requirements for information systems are continually updated, leading to repeated system redesigns and redeployments. Because industry has already made significant investments in improvements to information systems to comply with the existing state-mandated systems, each new state system is projected to cost 20% of the average one-time cost of previous information system improvements.

Specifically on reporting requirements, there has been some effort to harmonize these requirements at a high-level in the respective state statutes. However, information from industry and an analysis of state-specific reporting processes and submission requirements suggest that differing requirements vary enough across state programs to require independent reports.

A national system is also reasonably assumed to require registration, reporting and product identification as do these 4 state programs – but compliance would be directed to a single recipient under a single set of requirements. Quantifying the percentage of state compliance costs that are duplicative dead weight requires analysis of the compliance burden in each state and a comparison of similar requirements in the national model. If compliance costs were equal across all 4 states, and equal to compliance costs of a national program, then 75% of the existing state compliance burden would be considered dead weight costs. However, compliance costs vary across state programs and national program compliance costs would be anticipated to be relatively high.

Given this, compliance costs under a single national system are assumed to be 50% of the current costs to comply with the 4 state systems. Thus 50% of the total estimated recurring costs for this cost driver is considered dead weight for the purposes of this study.

In each new state where there is an Advance Recovery Fee (ARF), retailers and manufacturers selling directly must review and revise requirements, in addition to redesigning and redeploying information systems.

Collectors and recyclers also report to state governments, including differing environmentally sound management practices and materials tracking requirements (e.g., California export reports). However, given the lack of conclusive evidence about how much of the collector/recycler compliance costs are directly due to the state patchwork, no estimates of collector/recycler costs are included in the dead weight cost totals.

*Cost Types:*

- *General and Administrative (recurring costs) @ \$7.3 million, 50% of this is dead weight or \$3.65 million*
- *Capital Improvements (information system costs) @ \$10.6 million per state one-time sunk costs (average across 4 existing state programs), estimated one-time dead weight costs per new state mandate is 20% of \$10.6 million or \$2.1 million*

### ***Cost Driver #3: Redundant System Administrations (ongoing agency costs only)***

Following the passage of unique electronics recycling legislation, to date each state has developed independent systems for administering the state program. All administrative systems to date are “stovepiped” and operate independently of other state administrations<sup>6</sup>. Systems in California and Maryland are managed solely by government; administration in Maine is shared between the government and approved consolidators, and in Washington it is financed exclusively by manufacturers but operated by government, manufacturers and a new quasi-governmental Authority.

Major administrative duties required in various state programs and their redundancies include:

- Billing systems (e.g., ARF fees in California, consolidator fees in Maine)
- Producer registration (all)
- Returned brand counts (Maine, Washington)
- Orphan product determinations and calculations (Maine, Washington)
- Enforcement, including identifying responsible brands, producers and/or retailers (all)
- Public education (all)

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<sup>6</sup> Note that state programs could be implemented across state lines as conceived by stakeholders involved in regional legislative initiatives (e.g., CSG/NERC, the Greater Midwest Initiative) and the Pacific Northwest Third Party Organization study.

- System governance/oversight (e.g., default Authority in Washington, CIWMB in California, Maryland DEP, Maine DEP)
- Appellate procedures for challenges to administrative decisions
- Fund management. Each state creates a unique fund management system, either for all recycling funds (California, Maryland), through consolidators (Maine), or a state-created authority (WA). Some states also use these funds to manage penalties against non-compliant companies.

Furthermore, each state develops and starts their program independently. Redundant system administration start-up activities across all states include:

- Regulatory development
- Development of guidance materials for system participants
- Development of internal procedures, particularly for fiduciary responsibilities
- Development or selection of environmentally sound management standards for processors and other e-waste handlers
- Public liaison capability to respond to citizen, press inquiries

Since a national system would still require many of these same functions – but without redundancy, and not repeated across multiple states as with the state patchwork – only a fraction of the total costs associated with this cost driver are considered dead weight for the purposes of this study. For example, a national program might well require producer registration, revenue collection, enforcement activities, and public education as do each of the four existing state programs (albeit each in their own way). The cost of many of these activities would reasonably be expected to increase proportionately to the population being served, thus providing no cost savings at a larger, national scale. However, some of these administration costs are redundant at a state level when compared to a national system: producer registration, brand counts, share calculations, fund management, regulatory development, guidance documents, procedure development and public liaison activities could and probably would all be done centrally in a national system. While critical to successful program implementation, these redundant state activities constitute a relatively small proportion of the overall program administration costs. This study estimates that 20% of the recurring system administration costs currently incurred by the 4 state programs is dead weight in comparison to a national program, while 80% would be assumed required in a national system. For one-time costs, the study estimated the average state program start-up costs across the 4 existing state programs. This average is a considered dead weight cost for any new state program.

*Cost Types:*

- *Direct Labor (recurring costs) @ \$11.9 million total across 4 existing state programs, 20% of this \$11.9 million is dead weight or \$2.4 million*
- *Capital Improvements (e.g., information systems) @ \$813,750 per new state program, 100% dead weight*

#### ***Cost Driver #4: Redundant Program Development Engagements (pre-implementation)***

For the past decade stakeholders of all stripes have participated in at least a dozen state-level study committees lead by state environmental departments and legislatures. Beyond these formal study efforts there have been literally thousands of meetings with state officials and other stakeholders to discuss, plan and debate the trajectory and details of state e-waste recycling programs.

Since a national system would not require multiple engagements with state-level stakeholders seeking to develop state programs, all costs expended by stakeholders for this cost driver are assumed dead weight for the purposes of this study.

**“The continuing evolution and increasing complexity of state program requirements creates uncertainty for manufacturers, retailers, recyclers and local governments interested in planning for the future.”**

#### *Cost to Manufacturers, Retailers and Recyclers*

Industry stakeholders regularly attend and participate in the dozens of different state task forces and study committees. On the legislative front, electronics recycling legislation is annually introduced into dozens of state legislatures, thereby requiring continuous review, comment and advocacy on dozens of legislative proposals introduced in dozens of state legislatures. *Cost Type: General and Administrative @ \$7.7 million, 100% dead weight*

#### *Cost to Government*

Each state agency that has explored electronics recycling has explored virtually the same set of system options including financing, environmentally sound management guidelines, administrative processes, enforcement mechanisms, reporting and tracking systems, and stakeholder concerns. *Cost Type: General and Administrative @ \$1 million, 100% dead weight*

***Cost Driver #5: Future State Programs Trajectory Uncertain/Inhibits Planning (not quantified)***

The continuing evolution and increasing complexity of state program requirements creates uncertainty for manufacturers, retailers, recyclers and local governments interested in planning for the future. Unique state-specific product scopes and financing systems cause uncertainty not only for institutional stakeholders but also for consumers. Although it was not possible to quantify a specific cost associated with this cost driver, continued state-by-state policy uncertainty is a factor associated with the evolving state patchwork that would be eliminated in a single national system.

**Materials Handling and Processing Costs**

***Cost Driver: Potentially Higher Recycling Costs Associated with State Programs (not quantified)***

While state programs clearly provide some processing economies of scale when compared with locally-administered recycling systems, additional economies of scale are also possible in a national system. Relative to a hypothetical national system, state systems could incur higher recycling costs for two related but different factors:

1. Lack of economies of scale available in a national system, primarily the lack of national-scale volumes of collected electronics that would support higher volume/ lower cost automated systems, and
2. Market fragmentation resulting from state restrictions placed on the free flow of collected electronics outside their state boundaries (California, Washington)

However, limited data collected for this study did not provide conclusive evidence of how much processing costs economies of scale would be achieved in a national program. Thus no quantified estimate associated with this cost driver are included in the results of this study, but this should be a topic of further study.

## **Patchwork Inequities**

### ***Patchwork Inequity #1: State Program Financing Overlap, Over-chargers and Free Riders (not quantified)***

An inevitable result of unique electronics recycling systems across multiple states is a lack of a level playing field for industry and consumers. When viewed across state lines the current state patchwork results in instances of multiple payments made for recycling the same unit, and no recycling services received in others even when payment is made.

#### *Product Pricing Issues*

As prices are generally set for global and regional markets much larger than individual states (e.g., North America) the structure of sales channels inhibits the ability to mark-up the price of electronics sold into specific states. Furthermore, many electronics are sold through regional distribution networks and even developing a precise estimate of the number of units sold into a state can be difficult, if not impossible. Thus in systems where the producer pays the recycling bill (Maine, Washington) there may well be increase in prices for all units sold into the region. The unintended side effect is 1) under-charging consumers in states with recycling programs, and 2) over-charging consumers in states where they receive no recycling services.

#### *Inequity Examples*

1. Californians pay the California ARF, and might well also pay a share of the total recycling costs in Washington state
2. A TV bought elsewhere and moved to California and recycled gets a free ride
3. A TV bought in California, moved to Washington State or Maine and recycled there is paid for twice (by the consumer when purchased in California, by the manufacturer when disposed in Washington or Maine)

### ***Patchwork Inequity #2: ARFs May Only be Required from Retailers with a State “Nexus” (not quantified)***

If the seller of a covered electronic device in a state with an advance fee system does not have a physical location, representative or lease income in that state, the seller is not obligated to pay the fee. An excellent summary of the nexus issue is presented in the California Board of Equalization document “Out-of-State Sellers: Do You Need to Register in California?” available at <http://www.boe.ca.gov/pdf/pub77.pdf>.

### *Inequity for Certain Retailers*

Retailers with a physical presence in California must pay the fee, while any competitors performing direct sales without a presence in that state (e.g., wholly Internet or catalogue) are not legally obliged to pay the fee. Note that the lack of a clear legal obligation is currently limited to only a fraction of all Internet sellers and by August, 2006 most high-volume Internet sales are collecting and paying the ARF.

Out-of-state retailers who are not required to collect the fee may voluntarily register to collect the fee as a courtesy to their customers. However, that voluntary registration, by itself, does not make the retailer obligated to collect California use tax (see <http://www.boe.ca.gov/sptaxprog/ewfaqsreg.htm>).

### *Effects on Consumers*

In California, out-of-state sellers who are not required to hold a seller's permit or are not obligated to collect California use tax are not presently required to collect the fee. Consumers who buy from those retailers owe the fee to the state and are required to report and pay these uncollected fees on their annual state tax return.

### ***Patchwork Inequity #3: Other State-Level Enforcement Problems***

Given the size of most states and their inability to enforce against companies operating wholly outside state borders, enforcement against smaller and off-shore companies is not cost-effective or feasible for state programs. Thus, state programs can result in larger manufacturers bearing a disproportionate burden of financing a producer-pays system relative to smaller manufacturers.

### *Effect on Manufacturers*

In Maine, products with one of dozens of smaller brands have been received and documented by state-approved consolidators. Many of these small brands are difficult to track down and achieve compliance rates below the major manufacturers, thus driving up costs for all compliant manufacturers. While there are many of these small brands, they represent only a fraction of the total returns versus the brands claimed by compliant manufacturers.

### *Effect on Collectors/Recyclers*

State governments do not have the ability to audit and enforce against recyclers located out-of-state. While this limitation potentially \*decreases\* short-term recycler costs, this lack of oversight potentially increases the likelihood of long-term liability/closure issues associated with the management of certain materials of concern in historic electronic products (e.g., lead).

### *Effect on Government*

State governments enforce against as many smaller brands as possible, with the remainder financed as unidentified, unclaimed and potentially "orphan" wastes (Maine). The administrative cost of finding parties responsible for these small brands is burdensome. In California, government officials must use the power of persuasion to cajole remote sellers to pay the advance fee using the "nexus" argument (see <http://www.boe.ca.gov/pdf/pub77.pdf>). Finally, state-level enforcement constraints have resulted in Maryland's program only registering 39 of the potentially hundreds of computer manufacturers producing an annual average of 1,000 units during the past 3 years.



## Part 3: Analysis and Cumulative Patchwork Cost Estimate

Data were gathered from different stakeholders to develop quantified estimates of total costs to comply with existing state electronics recycling programs. Once these data were extrapolated to stakeholder-wide estimates, each cost driver was analyzed to determine what, if any, portion of those costs would be required in a national electronics recycling system. Costs identified as higher in state systems than would otherwise be the case under a comprehensive national system were identified and classified as dead weight costs. This analysis was performed using the following assumptions, data, analysis and methodology.

### Comprehensive National Program Assumptions

- E-scrap collection done locally with financing from a centralized Collection Incentive Payment (CIP) system or similar national-scale financing mechanism
- There will be one coordinated administrative system to oversee financing, coordinate reporting, enforcement and other program requirements
- E-scrap is treated as an interstate commodity and will move across state lines without consideration of the state of origin, and costs for policing importation of used electronics into the U.S. are negligible (Canadian provinces are developing their own comprehensive programs and therefore no policing necessary; may be required near population centers near the U.S.-Mexican border)
- Enforcement will be done by the federal government where necessary, with some oversight and/or delegated authority performed by state government where appropriate (e.g., environmental management standards above and beyond national standards for processors, collectors)
- One set of national program requirements on financing, information reporting, record keeping, etc. would exist across the United States, be established at program initiation and would not change substantially over time

### Data Sources

- The NCER interviewed principal public and private stakeholders involved in the administration and implementation of state e-waste programs, including large industry stakeholders subject to state program requirements. Data were collected during NCER site visits to California and Maine, and discussions with implementation officials in Maryland and Washington State.

### Analysis and Methodology

- *All Stakeholders.* Estimates of the universe of different stakeholders were developed where possible from reported state program data. Care was taken to ensure unique counts of each stakeholder, even though many stakeholders perform multiple roles in each system (e.g., a manufacturer who also sells their products directly to consumers).

- Manufacturers.* Manufacturers were segmented into 4 tiers for the purposes of estimating compliance costs with the 4 state programs: Very Large, Large, Middle-Tier and Small. Although the number of compliant manufacturers varied across the 4 state programs from a low of 37 in Maryland to 135 in Maine, the variation was observed primarily in the Small manufacturer tier. Cost drivers with significant costs to manufacturers were Cost Driver #2 (Multi-State Compliance). Start-up costs in this Driver were averaged across the 4 programs and assumed to be 20%<sup>7</sup> of that average for all tiers of manufacturer complying with each new state implementing a mandatory electronics recycling program. Recurring manufacturer costs for complying with Costs Driver #2 across all 4 states were estimated to be 50%<sup>8</sup> of the recurring costs associated with complying with a future national electronics recycling program. Cost Driver #4 (Redundant Program Development Engagements) was also a significant driver of dead weight patchwork costs, particularly for very large manufacturers.
- Retailers.* Similar to manufacturers, retailers were also segmented into 4 tiers for the purposes of estimating compliance costs with the 4 state programs: Very Large, Large, Middle-Tier and Small. Good data on the number of active retailers complying with state requirements were available only in California (8,500), and the number of affected retailers in other states was assumed to be smaller proportionate to California's population and in the Small retailer stratum. As with manufacturers described above, cost drivers with significant costs to retailers were Cost Driver #2 (Multi-State Compliance). Start-up costs in this Driver were averaged across the 4 programs and assumed to be 20% of that average for all tiers of retailers complying with each new state implementing a mandatory electronics recycling program. Recurring retailer costs for complying with Costs Driver #2 across all 4 states were estimated to be 50% of the recurring costs associated with complying with a future national electronics recycling program, except for small retailers who were assumed to be state-only operations and therefore subject to no dead weight patchwork costs. Cost Driver #4 (Redundant Program Development Engagements) was also a significant driver of dead weight patchwork costs, particularly for very large retailers.

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<sup>7</sup> Based on manufacturer and retailer feedback on actual and potential compliance costs for additional state systems. Some industry respondents cited substantial one-time compliance costs for development of a point-of-sale ARF system, but noted that costs any additional system would be less.

<sup>8</sup> As noted in Part 2 of this study, a national system is assumed to require registration, reporting and product identification as do these 4 state programs – but compliance would be directed to a single recipient under a single set of requirements. Quantifying the percentage of state compliance costs that are duplicative dead weight requires analysis of the compliance burden in each state and the national model. If compliance costs were equal across all 4 states, and equal to compliance costs of a national program, then 75% of the existing state compliance burden would be considered dead weight costs. However, compliance costs vary across state programs and national program compliance costs would be anticipated to be relatively high. Given this, compliance costs under a single national system are assumed to be 50% of the current costs to comply with the 4 state systems. Thus 50% of the total estimated recurring costs for this cost driver is considered dead weight for the purposes of this study.

- *Collectors/Recyclers.* Dead weight costs for this stakeholder were dominated by Cost Driver #1 (Policing/Excluding Out-of-State Wastes) as most of the burden for ensuring and documenting the collection of in-state e-waste falls on this stakeholder. Collectors and recyclers were analyzed independently where costs affected on one or the other, and estimates for universe size were available in California and Maine.
- *Government.* Many of the tasks performed by state government officials running electronics recycling programs would also be required at the national level (see Cost Driver #3: Redundant System Administrations). The primary variable in determining the federal burden for program administration is the type of system chosen, not whether the program is run at a state or federal level. However, multiple independent state-level programs are inherently redundant at several levels detailed in this report and are estimated to be 20% higher than required at a national level. Other notable dead weight costs incurred by states include Cost Driver #1 (Policing/Excluding Out-of-State Wastes) and #4 (Redundant Program Development Engagements).

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