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## The German Recycling Experiment and Its Lessons for United States Policy

Steven P. Reynolds

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## THE GERMAN RECYCLING EXPERIMENT AND ITS LESSONS FOR UNITED STATES POLICY

STEVEN P. REYNOLDS†

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† Legal Counsel, Texas Instruments Incorporated; J.D., Rutgers University (1987); A.B., Georgetown University (1983). The opinions expressed in this article are those of the author and not those of Texas Instruments Incorporated.

## I. INTRODUCTION

**P**OLICYMAKERS in industrial nations around the world are seeking resolutions to the problem of managing nonhazardous solid wastes. In the United States, both at the federal and state levels, legislatures are currently debating a wide range of proposals. It is only natural to examine the successes and failures of other nations which have already attempted to create systems for dealing with similar problems. In 1991, Germany instituted an aggressive program intended to collect substantial quantities of recyclable packaging materials and promote the recycling and reuse of those materials. The German program additionally sought to eliminate the use of landfills and incinerators. This Article examines the German recycling system, discusses the consequential effects of that system and reviews possible alternatives for policymakers to consider.

## II. THE PROBLEM AND THE SEARCH FOR SOLUTIONS

All modern industrial countries generate substantial amounts of solid waste. Sources of those wastes include industrial, commercial and household activities.<sup>1</sup> There are a variety of ways in which these waste materials may be handled. This flexibility is particularly great, at least in theory, when considering nonhazardous solid waste. Options for the disposal of nonhazardous solid waste include landfilling, incinerating, recycling and dumping. The cost of each option varies greatly and is a function of economic, technical, political and regulatory factors.<sup>2</sup>

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1. Of an estimated 180 to 200 million tons of solid waste generated annually in the United States, at least two-thirds are deposited in landfills. *Recycling: Is it Worth the Effort?*, CONSUMER REPORTS, Feb. 1994, at 92, 95 (citing EPA source); George C. Lodge & Jeffrey F. Rayport, *Knee-deep and Rising: America's Recycling Crisis*, HARV. BUS. REV., Sept.-Oct. 1991, at 128, 132; Glenn Ruffenach, *Alchemist for 1990's Takes on Garbage*, WALL ST. J., Nov. 17, 1992, at B4 (citing National Solid Wastes Management Association figures). The amount of municipal solid waste generated in the United States has more than doubled since 1960. *Recycling: Is it Worth the Effort?*, *supra*, at 95. The remaining one-third of this solid waste not deposited into landfills is incinerated or recycled. Ruffenach, *supra*, at B4. Since 1985, the popularity of recycling and incinerating solid waste has been slowly increasing. *Recycling: Is it Worth the Effort?*, *supra*, at 95.

2. Landfill costs vary widely and are based, in part, on the municipality's location. Jeff Bailey, *Space Available: Economics of Trash Shift as Cities Learn Dumps Aren't So Full*, WALL ST. J., June 2, 1992, at A1. For example, Morris County, New Jersey must pay approximately \$131.00 per ton to dispose of its waste due to local capacity shortages, which results in the shipping of waste generated in that region to a landfill in Pennsylvania. *Id.* On the other hand, San Jose, California pays an average \$10 a ton for disposing of its waste in a local landfill. *Id.* Prices of each method of waste disposal fluctuate according to availability of space, the competition between these means and the imposition of environmental safeguards on each of these means. *See id.*

While normal operation of the market economy is responding to this situation, many observers consider the speed of progress inadequate.<sup>3</sup> This impression is, in part, driven by an anti-growth, anti-free enterprise bias on the part of many environmental advocates.<sup>4</sup> Many environmentalists view new packaging materials as wasteful excess promoted by a greed-driven industry, rather than innovative and beneficial responses to consumer needs and demands.<sup>5</sup> For many years, the cost of waste disposal has been minimal and almost entirely financed by tax dollars. This has not encouraged manufacturers to consider the issues of recycling and disposal of their products and packaging.<sup>6</sup> Many commentators believe that government must intervene to minimize the amount of waste created.<sup>7</sup> The most viable option may be to promote recycling.

In the United States, additional problems exist as a result of varying regional conditions and situations. A variety of factors place enormous pressure on politicians to respond to the problem.<sup>8</sup> While there is adequate land in the United States to build additional landfills and incinerators, the political reality is that in most of those communities, local opposition defeats or delays efforts to

3. *Germany's Polluter Pays Concept Could Be Applied to U.S. Industry*, Int'l Envtl. Daily (BNA) No. 5 (April 13, 1994). "The United States is increasingly alone among industrial countries in not having a policy . . . in which it asks industry to be a major participant in solid waste disposal." *Id.* (quoting Jim McCarthy, Senior Analyst for solid waste issues with Congressional Research Service). Progress is being achieved, however, through recycling as the 5,500 communities in the United States currently recycling waste materials demonstrate. *Id.* Recycling of solid waste in the United States has increased from a rate of 17% in 1990, to 20%. *Id.* See also ALBERT GORE, *EARTH IN THE BALANCE: ECOLOGY AND THE HUMAN SPIRIT* 159 (1992) (declaring system and mass process changes necessary to effectuate recycling goals in addition to individual enthusiasm).

4. See e.g., Steven E. Landsburg, *The Religion of Environmentalism*, ACROSS THE BOARD, March 1994, at 41-42 (criticizing "religion of environmentalism" for moral posturing). "The science of economics shuns such moral posturing; the religion of environmentalism embraces it." *Id.*

5. Vice President Gore, for example, stated that "[m]ost packaging is designed exclusively for its usefulness in marketing its product, with no thought to the space it consumes in landfills . . . ." GORE, *supra* note 3, at 158-59. See also Anne Johnstone, *Assault on the Packaging Mountain*, THE GLASGOW HERALD, Aug. 31, 1994, at 15 (presenting both sides of the packaging debate in Scotland).

6. See GORE, *supra* note 3, at 159 (stating barriers to encouraging recycling by manufacturers includes public subsidies for virgin materials).

7. See Steven P. Reynolds, *Recycling: A Report From the Laboratories*, 4 VILL. ENVTL. L. J. 323, 357-60 (1993); see also Lodge & Rayport, *supra* note 1 (calling for partnership of government and business in promoting recycling).

8. See Jay Stuller, *The Politics of Packaging*, ACROSS THE BOARD, Jan.-Feb. 1990, at 41. Solid waste disposal is one of the most pressing public policy issues of the 1990's. *Id.*

site new facilities.<sup>9</sup> Organized environmental groups also oppose these efforts because of the fear that landfills and incinerators pose threats to air and water conditions.<sup>10</sup> This crisis motivated a great number of communities to begin curbside and drop-off collection programs to recover waste materials for recycling.<sup>11</sup>

### III. THE GERMAN EXPERIMENT

Germany faced a similar situation and responded by enacting legislation which led to the creation of a government-industry system for collecting, sorting and recycling packaging waste materials.<sup>12</sup> An industrial and scientific power since the late 1800's, Germany has also been innovative in blending government initiatives with a largely free market economic system.<sup>13</sup> Today, Germany is a leader in the push for environmental regulation and has been operating, for the past three years, a system which could represent the future of nonhazardous waste management in the United States.

#### A. Background

Germany began to focus on the problem of nonhazardous waste disposal in the 1980's. Waste management laws were

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9. See Pierre Louis, *Recycling or Not?*, EUR. PACKAGING NEWSL. & WORLD REP., Aug. 1992, at 1-2 (citing study of available land in New York).

10. See Robert Frederiksen, *Activists Say Recycling Better For Economy Than Incinerator*, PROVIDENCE J.-BULL., Feb. 27, 1993 at A8 (citing advocates who argue that landfills and incinerators cause pollution and waste natural resources); *Out of Sight, Out of Mind?: Where Household Goods Go*, CONSUMER REP., Feb. 1994, at 99 (citing dangers of both incinerators and landfills with respect to durable goods).

11. A typical example is California. See e.g., California Integrated Waste Management Act of 1989, CAL. PUB. RES. CODE § 40000 *et seq.* (West Supp. 1994). California required local municipalities to reduce shipments of waste materials to landfills by 25% by 1995 and 50% by the year 2000. Local entities, in an attempt to comply with the demands imposed by the state, created curbside and drop-off collection programs. See also Bill Richards, *Trash Dance, Recycling in Seattle Sets National Standard But is Hitting Snags*, WALL ST. J., Aug. 3, 1993, at A1 (reporting on successes and failures of one of America's leading municipal programs).

12. See The Ordinance on the Avoidance of Packaging Waste (Verpackungsverordnung), (June 12, 1991) (English translation on file with the *Villanova Environmental Law Journal*).

13. Germany is the largest economy in Europe according to a comparison of European nations' gross national product ("GNP") figures, and the third largest economy in the world. Lori Cooper and Marie Treinan, *European Integration - The EC and Beyond*, BUS. AM., Mar. 8, 1993, at 17-18. Germany was the third country to become a major industrial power, following Great Britain and the United States. Germany also has a history of government intervention in the economic system, including support of technical education and social welfare benefits. See MICHAEL BALFOUR, *WEST GERMANY* (1968); HENRY PACTER, *MODERN GERMANY: A SOCIAL, CULTURAL, AND POLITICAL HISTORY* (1978).

amended in 1986 to focus on preventing nonhazardous waste.<sup>14</sup> Toward the end of the decade, German policymakers started looking to the recycling of waste materials as a major part of the solution. In 1989, the German government worked with industry to create a voluntary program designed to encourage recycling of waste materials.<sup>15</sup>

The new decade would see a new strategy arrive in Germany. Because Germany is a highly industrialized country with relatively little available land for landfills, German environmentalists advocated reducing the amount of waste produced by requiring manufacturers of goods to use recyclable packaging.<sup>16</sup> German public opinion was becoming increasingly influenced by environmental advocates, and politicians felt considerable pressure to do something about the problems associated with nonhazardous waste.<sup>17</sup> Public opinion strongly opposed incineration and landfilling. Ger-

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14. Germany passed the Waste Control Act of 1972 (*Abfallbeseitigungsgesetz*) after constitutional amendments gave the federal government powers to deal with waste control and disposal issues. See BGBI, 1972, Pt. I, at 873. The 1986 amendments to this law emphasized the role of waste reduction and waste recycling. See *Gesetz über die Vermeidung und Entsorgung von Abfällen*, BGBI, 1986, Pt. 1, at 1410 and 1501. See also Punder, Volhard, Weber & Axster, *Germany: Doing Business in Europe, Environmental Rules* (CCH) (2d Vol. 1990).

15. This is not unlike the Dutch Covenant between government and industry in the Netherlands. See Reynolds, *supra* note 7, at 341-42. See also *Germany, Netherlands Seen Leading Europe in Waste Minimization*, INTEGRATED WASTE MGMT., Jan. 8, 1992, at 1, available in LEXIS, Nexis Library, IWM File (reporting Germany targeting packaging recycling as major waste avoidance measure); *Issues: Environment - Update and Outlook on the EC Initiatives on Packaging and Packaging Waste*, MONITOR, (Aug. 14, 1991), at A5-A7.

16. Due to this scarcity of space, German landfill costs for disposal of municipal solid waste are among the highest in the world, ranging from 40 to 60 British pounds per ton. Bronwen Maddox, *Business and the Environment: Politics Ahead of Science - The Debate Surrounding Waste Disposal Around the World*, FIN. TIMES, Mar. 2, 1994, at 20. Other European countries face lower costs. *Id.* (France, 20 to 36 British pounds per ton; Finland, 14 to 29 British pounds per ton; United Kingdom, 6 to 18 British pounds per ton; Spain, 2 to 10 British pounds per ton; Sweden, 10 to 43 British pounds per ton). Costs in the United States are less, but vary sharply by region. *Id.* Other parts of the world have relatively low disposal costs. *Id.* (Australia, 3.5 to 12 British pounds per ton; New Zealand, 12 to 18 British pounds per ton; Latin American countries, 2 to 4 British pounds per ton; and Southeast Asian countries, 1.5 to 5 British pounds per ton).

17. Sharon Reier, *Seeing Red Over Green Dots*, FINANCIAL WORLD, Mar. 1, 1994, at 38 (Greens predicted that Germany would run out of landfill availability by 1996); Rebecca Rolfes, *How Green Is Your Market Basket?*, ACROSS THE BOARD, Jan.-Feb. 1990, at 49-50 (discussing growth of German Green movement and consumer goods manufacturers' awareness of consumer desires to purchase "green" products).

many also experienced local public opposition to siting decisions for waste facilities.<sup>18</sup>

In 1990, the German government enacted a deposit law on one-way polyethylene terephthalate ("PET") bottles.<sup>19</sup> Since most German beverage packagers use returnable bottles, this law impacted importers more than domestic companies.<sup>20</sup> Several companies from other European countries complained to the European Community ("EC") Commission that the deposit law was a hidden trade barrier.<sup>21</sup> The EC Commission agreed with the foreign bottlers, finding fault with Germany's focus on a single material and product and threatened to take action.<sup>22</sup>

Germany viewed this decision as unfair interference with domestic environmental policies.<sup>23</sup> Some policymakers called for a comprehensive law that would ban certain packaging materials and force the use of returnables and recycled materials.<sup>24</sup> A more moderate alternative was crafted by the German Environmental Ministry and proposed in the place of the earlier deposit law.<sup>25</sup>

#### B. 1991 Law: The Toepfer Decree

Germany enacted the Avoidance of Packaging Waste Ordinance which was to take effect on June 12, 1991.<sup>26</sup> The ordinance, referred to as the Toepfer Decree in honor of its principle architect German Environmental Minister Klaus Toepfer, established an aggressive series of mandatory recycling goals to be completed in two steps. First, the German government planned to collect fifty per-

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18. Doctor Herbert Gehring, Assistant Director of Department for Avoidance and Utilization of Waste, German Ministry for the Environment, Address at the Institute of Packaging Professionals Conference on Environmental Packaging Legislation (July 16, 1993) [hereinafter Gehring Address] (notes on file with author).

19. See Jonathan Sims, Address at Financial Times Conference on International Packaging and the Environment, at 7.1 [hereinafter Sims Address]. This frequently recycled plastic resin is used primarily in soft drink bottles. *Id.* One-way bottles refer to bottles that are not included in a returnable program. *Id.*

20. *Id.*

21. *Id.*

22. *Id.*

23. Sims Address, *supra* note 19, at 7.1.

24. *Id.*

25. Gehring Address, *supra* note 18; Sims Address *supra* note 19, at 7.4.

26. The Ordinance on the Avoidance of Packaging Waste (Verpackungsverordnung), (June 12, 1991) [hereinafter Packaging Ordinance] (English translation on file with the *Villanova Environmental Law Journal*). The decree's primary objective is to ensure that packaging of all products be manufactured from "environmentally compatible" materials. *Id.* art. I (setting forth four goals: (1) avoidance of packaging waste; (2) reduction of packaging waste; (3) reuse of packaging; and (4) recycling of packaging waste).

cent of all packaging materials by January 1994.<sup>27</sup> The second, and more aggressive step required collection by July 1995 of eighty percent of all packaging. Collection facilities must recycle most of these materials.<sup>28</sup>

The establishment of recycling goals was not the most unique feature of the Toepfer Decree. In addition, it placed the primary burden of recycling on industry by imposing a "take-back" requirement on those who introduce packaging into the market.<sup>29</sup> The ordinance classified packaging in three categories: transport packaging, sales packaging and secondary packaging.<sup>30</sup> Since 1992, suppliers have been required to take back transportation and wrapping packaging.<sup>31</sup> Additionally, in 1993, suppliers had to begin the take-back of all sales packaging.<sup>32</sup> Consumers may leave packaging at the retail establishment or at other collection sites and retailers may send the materials back to their supplier at the supplier's expense.<sup>33</sup> Suppliers must arrange for the reuse or recycling of the returned packaging materials.<sup>34</sup> In sum, the Toepfer Decree requires retailers to take back packaging from consumers, manufacturers to retrieve packaging from retailers, and packaging companies to retrieve used packaging from manufacturers.<sup>35</sup> Also,

27. *Id.* Annex to art. VI, para. 3, part II.

28. By January 1993, the government planned to recycle 70% of glass, 65% of steel, 60% of tin plate, cardboard and paper, and 30% of plastics and compound materials. *Id.*, part III. By July 1995, Germany's goal was to recycle 90% of glass, tin plate and aluminum, and to recycle 80% of cardboard, paper, plastics and compounded materials. *Id.* In 1993, Germany recycled 66% of household paper waste, 55% of glass, 45% of steel and 20% of plastics. John Eisenhammer, *German Waste Drive Creates A Stink*, THE INDEPENDENT, Feb. 17, 1994, Business & City Page, at 37.

29. Packaging Ordinance, *supra* note 26, sec. II, art. 4-6. These provisions require the manufacturer and distributors of packaged goods to provide suitable collection containers at the point of sale for all packaging materials. *Id.* The statute exempts packaging of products such as pesticides and solvents that could pose a health or environmental risk. *Id.* sec. I, art. 2.

30. Transport packaging protects goods from damage during transport from the manufacturer to the distributor. Packaging Ordinance, *supra* note 26, sec. I, art. 3. This includes drums, containers, crates, pallets, shrink wrap and other items. *Id.* Secondary packaging serves as additional packaging around a product's sales packaging. *Id.* sec. I, art. 3 (including: blister packaging, plastic sheets, cardboard boxes and other similar packaging). Sales packaging covers the product and is used by consumers to transport the products or which remains on the products until they are consumed. *Id.* (including: cups, bags, blister packaging, cans, bottles, cartons, sacks and similar packaging).

31. *Id.* sec. II, art. 4; sec. IV, art. 13.

32. *Id.* sec. II, art. 5; sec. IV, art. 13.

33. *Id.*

34. Ferdinand Protzman, *A Nation's Recycling Law Puts Business on the Spot*, N.Y. TIMES, July 12, 1992, § 3, at 5.

35. Note, Frances Cairncross, *How Europe's Companies Reposition to Recycle*, HARV. BUS. REV., Mar.-Apr. 1992, at 34-35.



with respect to beverage containers, the ordinance replaced the criticized PET deposit law with a provision that required return or deposits on packaging for beverages, cleaning products, and emulsion paints.<sup>36</sup>

The German government's goal was to force German industry to consider disposal of its packaging waste as a part of a product's life cycle. The traditional cycle of development, production, sales, and consumption now includes disposal of the product's packaging. In other words, the costs of handling packaging wastes, namely the costs of collecting, sorting, recycling and/or disposing of materials, are internalized in the price of the product.<sup>37</sup> Subsequently, in a market economy these increased costs are ultimately paid for by consumers in the form of higher product prices.

### C. Establishment of the Dual System

In response to the Toepfer Decree, German industry took advantage of one section of the ordinance which permitted companies to call on third parties to fulfill their obligations.<sup>38</sup> The result was the creation of a dual system. A group of over six hundred companies formed a new entity, the Duales System Deutschland ("DSD") and authorized it to work with local governments to collect recyclable packaging materials.<sup>39</sup> The German government gave DSD exclusive rights to handle this business and set certain conditions on its operation.<sup>40</sup> These conditions included requirements that the program offer national coverage, locate collection bins close to consumers, establish routine collection schedules, integrate the collection plan with state and local systems and meet the quali-

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36. Packaging Ordinance, *supra* note 26, sec. III, art. 7-9.

37. Protzman, *supra* note 34, at 5. See generally Gehring Address, *supra* note 18; Clemens Stroetmann, State Secretary at the Federal Ministry for the Environment, Address at the Financial Times Conference on International Packaging and the Environment (Mar. 23, 1992), in FINANCIAL TIMES CONFERENCES, at 2.1 [hereinafter Stroetmann Address] ("We have to consider production of goods, their distribution, their consumption and their disposal as an integrated whole and have to redefine responsibilities according to the polluter-pays principle.").

38. Packaging Ordinance, *supra* note 26, sec. IV, art. 11.

39. Protzman, *supra* note 34, at 5; Dr. Ing Oelsen, General Manager of DSD, Address at Financial Times Conference on International Packaging and the Environment, in FINANCIAL TIMES CONFERENCES, at 15.1 [hereinafter Oelsen Address]. The Gesellschaft zur Rucknahme under Verwertung von Transportverpackungen ("RVT") is a similar organization that transports packaging. Pierre J. Louis, *Shipping to Europe, Which Transport Pack?*, EUR. PACKAGING NEWSL. & WORLD REP., Oct. 1992, at 5.

40. See Protzman, *supra* note 34, at 5; Oelsen Address *supra* note 39, at 15.1.

tative goals for collection and recycling set forth in the packaging ordinance.<sup>41</sup>

DSD created and maintained an infrastructure for the collection and sorting of materials.<sup>42</sup> Collection bins were placed in convenient locations to allow consumers to dispose of packaging materials.<sup>43</sup> DSD then contracts with companies to handle the recovery and the delivery of these materials to sorting plants.<sup>44</sup> Recyclers are paid by DSD to take the sorted materials.

Companies who wish to participate in the DSD program, thereby complying with the German statutory take-back requirement without the necessity of creating their own system, must apply for permission to use a "green spot" symbol<sup>45</sup> on their packaging materials. A product bearing the green spot is guaranteed to be composed of recyclable packaging. For a fee, DSD licenses the use of this symbol to companies whose materials DSD is willing to accept. Consumers and retailers may dispose of sales packaging bearing the green spot in DSD collection bins. Packaging not bearing this symbol cannot be disposed of in DSD bins and cannot be landfilled. The practical result is that retailers who do not want to have to send materials back to their suppliers, even if the supplier pays for any expenses, insist on using the symbol.

#### D. Developments: 1991-1993

DSD had some time to organize and operate its program before the implementation of the 1993 sales packaging take-back requirement and the higher second-step recycling goals in 1995. During the first two years after the dual system was instituted, unforeseen problems arose. For instance, the costs of implementation exceeded expectations. Additionally, the program produced an

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41. Gehring Address, *supra* note 18.

42. The original plan estimated an annual cost of two billion deutsche marks. See Cairncross, *supra* note 35, at 34, 36; Sims Address, *supra* note 19, at 7.4; Stroetmann Address, *supra* note 37, at 2.1.

43. DSD places the yellow collection bins (gelbe tonnen) in various places, including individual households. Protzman, *supra* note 34, at 5 (indicating presence of DSD bins in more than half the households in Germany). Approximately once a month, DSD provides for the collection of the bins with no cost to consumers. *Id.*

44. Stroetmann Address, *supra* note 37, at 2.3-2.4. By 1992, DSD had 60 sorting plants and plans to operate 200 plants by 1995. See Protzman, *supra* note 34, at 5.

45. The German phrase is "der grüne punkt." Oelsen Address, *supra* note 39, at 15.1. This translates to "the green spot" or "the green dot." The symbol is an arrows-chasing-arrows design, similar to that found in many recycling symbols.

overabundance of plastic material, leaving Germany with the challenge of selling this plastic in a soft world market.

### 1. High Costs Threaten the System

DSD's original financial projections were well off the mark. By mid-1993, DSD was running a deficit and nearly became insolvent.<sup>46</sup> The system proved to be remarkably effective at collecting waste materials, but it failed to achieve its recycling goals.<sup>47</sup> Despite substantial spending on plants and equipment to sort, process and recycle plastic materials,<sup>48</sup> DSD was unable to keep up with the flow of collected materials.<sup>49</sup> Because of this, DSD stored most of these materials in warehouses. Storage costs further drove up system costs and threatened DSD with insolvency.<sup>50</sup>

Some of the high system costs derive from practical management problems. Statements by German officials indicated that DSD had done a poor job of controlling costs and managing its business.<sup>51</sup> Some of these cost problems may suggest basic flaws in the system. For example, DSD has been slow to collect license fees from companies that use the green dot on their packaging.<sup>52</sup> While some companies are simply late in paying their licensing fees,

46. Eisenhammer, *supra* note 28, at 37. By the summer of 1993, DSD had debts of one billion deutsche marks. *Id.*

47. See Laurent Belsie, *Overeffective German Recycling Hits Hump*, CHRISTIAN SC. MON., Dec. 2, 1993, at 9 (discussing lack of capacity to recycle collected materials under DSD's system); Dean Murphy, *Germany's Recycling Nightmare*, L.A. TIMES, Sept. 12, 1993, at D3 ("German recyclers expect to collect 250,000 more tons of garbage than they can handle this year.").

48. It is estimated that it cost seven billion deutsche marks (over four billion U.S. dollars) to establish the system. See *Packaging Ordinance Leads Most Firms to Reduce Packaging, Improve Recyclability*, Int'l Env't Daily (BNA) (Apr. 13, 1993). The German government claims a figure between five billion and six billion deutsche marks. Gehring Address, *supra* note 18.

49. See *Germany's DSD May be DOA, But UK Authorities Like the Idea Anyway*, GREEN PACKAGING 2000, Aug. 1993, at 1, 2. In 1993, DSD collected 414,000 tons of plastics while the country's total recycling capacity was 165,000 tons annually. *Id.* For a discussion of the lack of capacity of German recyclers, see *supra* note 47.

50. One estimate is that DSD's collection and processing cost is \$460 per ton, roughly twice the price of collecting and disposing of other German household waste. Christopher Boerner & Kenneth Chilton, *False Economy: The Folly of Demand-Side Recycling*, ENVTL. JAN. 1994, at 6. Despite DSD's operating costs of three billion deutsche marks for 1993, the costs are expected to rise for 1994. *Packaging Waste Shows Major Drop in 1993; Ministry Plans Revisions to Packaging Law*, Int'l Env't Daily (BNA) (Jan. 28, 1994).

51. A program estimated to cost a total of two billion deutsche marks has already cost five to six billion deutsche marks. Gehring Address, *supra* note 18.

52. *Id.* See also Belsie, *supra* note 47, at 9 (stating only half of 15,000 companies using Green Dot have paid required fees); *Duales Says Specialty Retailers, Fast-Food Chains Dodging Contributions*, Int'l Env't Daily (BNA) (Aug. 11, 1994) (indicating DSD collected only one-third of its estimated revenue in 1993); Pierre J. Louis,

others ignore the requirement and use the symbol without authorization.<sup>53</sup>

Although maintaining cash flow appears to be a major part of the problem, it is also difficult for DSD to keep track of the multitude of companies, especially foreign companies, that sell products in Germany. Another significant problem is the abuse of the dual system by consumers. Many consumers, who are charged by municipalities based on the amount of trash collected from their household, choose to dump all sorts of trash in the yellow bins.<sup>54</sup>

## 2. Waste Exports

The severity of the problems associated with large volume waste collection varies with the type of packaging material. The biggest problem facing DSD is plastic packaging materials. Most metal, glass and paper packaging materials are readily recycled, although not necessarily profitably.<sup>55</sup> Also, although DSD found end-user markets for recycled materials in Germany, it had to look elsewhere in Europe to make its recycling program profitable. This poses some problems for foreign companies that sell recycled paper and glass materials. These companies allege that German recyclers sell waste materials at extremely low prices, driving their competitors out of business.<sup>56</sup>

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*Duales System Deutschland On The Move*, EUR. PACKAGING NEWSL. & WORLD REP., Sept. 1993, at 1, 2; Murphy, *supra* note 47, at D3 (discussing nonpayment of fees).

53. Gehring Address, *supra* note 18; See also Belsie, *supra* note 47, at 9; Louis, *supra* note 52, at 1, 2; Murphy, *supra* note 47, at D3.

54. Many communities in Germany, and in other countries including the United States, have changed their trash collection billing system from charging a standard fee per household to a volume-based fee giving consumers an incentive to reduce the amount of trash that they generate. German consumers began to misuse and abuse the collection bin system by including municipal trash with the recyclable waste. In fact, the German government estimates that 40% of the materials found in DSD's bins are not packaging materials. See Gehring Address, *supra* note 18; Louis, *supra* note 52, at 2.

55. For a discussion of the issues involving recycling of aluminum, steel, glass and paper, see Reynolds, *supra* note 7, at 330-34. While aluminum and glass recycling has been economically successful for several years, the low quality paper obtained from recycling and recycled plastics have been problematic as the markets for both are saturated. Protzman, *supra* note 34, at 5.

56. For example, while in 1992 low quality waste paper was worth \$7 per ton, and corrugated boxes were worth \$53 per ton, by 1994 their values have significantly decreased. Reier, *supra* note 17, at 38. Newspaper recyclers in the United States used to get \$60 per ton for their material from East Asian companies, but because of German exports today they have to pay someone to take it away. *Id.*

In 1993, Germany exported 1.3 million tons of waste paper, virtually giving it away to recyclers. Eisenhammer, *supra* note 28, at 37. The bulk of German exports go to France and Britain. Ariane Genillard, *Recycling Has Neighbours Crying Foul-Complaints of Cheap Waste Exports to European Countries*, FIN. TIMES, Jan. 25, 1994,

Germany's need to get rid of excess plastic materials has been very problematic. Soon after DSD was established, attempts were made to export excess plastic materials to other countries in Europe, including France, that incinerate plastics for energy recovery.<sup>57</sup> However, objections to this approach were raised by environmentalists, including those in Germany, who complained about air pollution caused by incinerating plastics.<sup>58</sup> This practice of shipping waste to France caused further problems between the two countries in 1992, when French authorities intercepted a shipment of materials from Germany containing hazardous medical waste.<sup>59</sup>

German industry also attempted to ship plastic materials to less developed countries in which environmental regulations were lax or nonexistent and where the demand for foreign currency was high. German companies began offering to pay these foreign entities to take shiploads of German plastic waste. This practice, and the increasingly common practice of shipping wastes to the third world, raised concerns in many of these nations.<sup>60</sup> An increasing number of countries passed legislation banning the importation of even nonhazardous waste materials.<sup>61</sup> Various environmental

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at 6. Both of these countries accuse Germany of undermining their own arrangements for recycling within their respective borders. *Id.*

57. *Id.* France burns approximately 40% of its annual collection of plastic packaging waste for energy. Ken Fouhy et al., *Plastics Recycling's Diminishing Returns*, CHEM. ENG., Dec. 1993, at 30, 33.

58. Louis, *supra*, note 9, at 1. Plastics may contain toxic elements such as chlorine and heavy metals like lead, mercury, chromium and cadmium. *Id.*

59. See French, *German Officials Agree on Measures Governing Transport of Hazardous Waste*, Int'l Env. Daily (BNA) (Sept. 4, 1992) (reporting French and German accord establishing principles governing restrictions on cross border waste); *Waste: French Decree and Franco-German Decisions*, EUROPE ENV'T, Sept. 8, 1992 (discussing scandal over German waste disposal in France and France's subsequent prohibition of German waste shipments). The European Community ("EC") subsequently agreed to regulations on shipments of waste materials. See Regulation 259/93 on the Supervision and Control of the Shipment of Wastes Within, Into and Out of the European Community, O.J. L 30/1 (Feb. 6, 1993). The Shipment of Wastes regulation establishes different sets of rules for waste materials depending on the classification of the material. *Id.* See also *Environmental Ministers Agree on Waste Shipment Regulations*, Int'l Env't Daily (BNA) (Oct. 21, 1992) (discussing October 1992 agreement allowing EC countries to ban imports of waste from industrialized countries, including other EC countries, subject to restrictions).

60. Mochter Lubis, *Jakarta Says No Thanks; Southeast Asia Becomes Target For Waste Exporters*, WORLD PAPER, Mar. 1993, *The Disposable Society*, at 3. Germany is one of several countries to liberally ship plastic wastes to less developed countries. See Ann Leonard, *Environment: Third World Dumping Ground For Plastic Wastes*, INTER-PRESS SERVICE, Oct. 22, 1992 (claiming American plastic industry exports non-biodegradable plastic waste to developing nations due to lax regulations).

61. Many nations agreed to ban the practice of shipping hazardous waste materials across national borders by signing the 1989 Basel Convention on the

groups exposed the economic impact on third world peoples caused by the practice of dumping waste materials. By the end of 1992, DSD and its affiliated companies were forced to cease the practice due to public and political pressures.<sup>62</sup>

### 3. *Successes of the Dual System*

The German system has its share of problems, but it is not without its successes. Any objective review of the dual system requires examination of its impact on waste reduction, packaging usage, and the technological innovation and development of recycling. Minister Toepfer and other officials glowingly spoke of a volume reduction in the amount of packaging introduced in Germany.<sup>63</sup> While statistics may be suspect, particularly because the German economy has been in a recession, there probably has been a decrease in the amount of packaging waste due to creative attempts to market products without unnecessary packaging. This change in marketing practice is the German industry's reaction to the added costs of the strict regulations. A review of packaging innovations at Germany's Interpak Trade Show during the 1990's indicates a rapid increase in creative "green" packaging ideas and concepts coming from the German consumer goods market.<sup>64</sup> Some of these concepts may be applicable in other markets and could create competitive advantages for German companies exporting to other countries whose legal regimes or consumer preferences favor "green" packaging.

Additionally, Germany has become a world leader in recycling technology. Experience in designing, building and operating recycling plants and equipment could prove to be valuable as other nations look to increase their own recycling capacity.<sup>65</sup> DSD and

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Transfrontier Shipment of Hazardous Waste. *See* Basel Convention on the Control of Transboundary Movements of Hazardous Wastes and Their Disposal, March 22, 1989, 28 I.L.M. 657. However, this treaty does not regulate shipments of non-hazardous waste materials. *See id.*

62. Lubis, *supra* note 60, at 3 (discussing effect of used plastic imports in third world countries upon indigent citizens of those countries).

63. Gehring claims a 20% reduction in the amount of packaging waste being sent to landfills. Gehring Address, *supra* note 18 (citing 1991-92 statistics indicating a reduction of 500,000 tons of packaging material). DSD claims that 600,000 fewer tons of packaging were used in Germany in 1992 than in 1991. Louis, *supra* note 52, at 2-3; *see also* Eisenhammer, *supra* note 28, at 37 (citing supporting statistics of the declining packaging waste in Germany).

64. *See Interpak '93: Germany's Green Machine Dominates Packaging's Big Show*, GREEN PACKAGING 2000, June 1993, at 1-4.

65. *German "Dual System" For Recycling Could Double Waste Equipment Market*, INTEGRATED WASTE MGMT., Nov. 24, 1993, at 3 (discussing Germany's need for waste collection systems and technology).

government-supported research and development projects focusing on methods for converting plastic waste into usable petrochemical products may also reap benefits for the German chemical industry, which has been a world-leader for many years.<sup>66</sup> Additionally, it is likely that DSD, with its labor-intensive collection and sorting activities, will create a number of jobs.<sup>67</sup>

#### E. The 1993 Bailout and Other Changes

In 1993, DSD addressed its cost issues. First, it dealt with its immediate cash needs by raising license fees to cover its shortfall and mounting expenses. In July 1993, DSD raised the fee for green spot licenses for plastic packaging materials.<sup>68</sup> The new fee structure was based on weight and disposal costs, whereas the original fees were based solely on the volume of each package.<sup>69</sup> DSD also sought additional financial assistance to improve its position. In the summer of 1993, various parties structured a bailout in an effort to stabilize the situation.<sup>70</sup> Future increases may also be necessary as the costs of the German experiment grow.

Furthermore, DSD sought to reduce its recycling burden. DSD officials formulated plans to develop the plastic recycling operations into a new, separate company.<sup>71</sup> DSD also sought permission from the German government to dramatically restrict the types of plastic materials that it was responsible for, leaving some fifty-seven percent of plastic packaging to be collected by state governments for landfilling or incineration with energy recovery.<sup>72</sup> Local gov-

66. German industry accounts for 16% of total world exports of chemicals. MICHAEL PORTER, *THE COMPETITIVE ADVANTAGE OF NATIONS* 358, 367 (1990) (noting that Germany's chemical exports exceed American and British exports).

67. Belsie, *supra* note 47, at 9 (providing Deutsche Bank Research estimates that the system will create 18,000 new jobs through 1995).

68. Pierre J. Louis, *European Leaders In Plastic Bottles Recycling*, EUR. PACKAGING NEWSL. & WORLD REP., at 2, 4. The increase was substantial, from eight cents a pound to seventy-eight cents a pound. *Id.*

69. Colin Isaacs, *New Packaging Initiatives Urgently Needed in Canada*, THE FINANCIAL POST, Aug. 20, 1993, § 1, at 10; Pierre J. Louis, *Interpack '93, Facts and Comments*, EUR. PACKAGING NEWSL. & WORLD REP., June 1993, at 1-2. The new fees are based on the weight of each package and the type of material used. *Id.*; see also Pierre J. Louis, *Green Dot Fees Now Based On Disposal Costs*, EUR. PACKAGING NEWSL. & WORLD REP., May 1993, at 1-3.

70. Contributions to the fund came from industry, manufacturers, retailers, utilities and state governments. Ron Pidgeon, *DSD Responds to Latest Criticism*, PACKAGING WK., June 17, 1993, at 6.

71. The new company, DEKUR Kunststoff Recycling GmbH, would be partially owned by DSD who would hold a 25% share in the new company. Louis, *supra* note 52, at 1-2. The rest would be owned by a number of companies in the plastic producing, processing, waste disposal, and utility industries. *Id.*

72. *Id.* at 3.

ernments opposed these developments and threatened to ban the use of certain packaging materials.<sup>73</sup>

In addition to its efforts to reduce the amount of plastics collected, DSD utilized technology to improve upon plastic recycling and make it more economically attractive. In mid-1993, DSD announced plans to depolymerize plastic wastes and produce fuels and other petrochemical products.<sup>74</sup> A cooperative venture between DSD, the German Environmental Ministry and the German chemical industry treated plastic materials in a thermal process, also known as plastic-to-chemical reprocessing. In this process the materials are chemically broken down into the constituent feedstock chemicals and then recombined into new petrochemical fuels.<sup>75</sup> German officials claim that this process is significantly better than incineration with energy recovery because it offers a higher energy balance yield and less pollution.<sup>76</sup> Most commentators believe that economically viable mass-scale depolymerization is still a distant reality.<sup>77</sup>

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73. This reaction is driven by cost issues and pressure from environmental groups that want to shift the emphasis away from plastics and instead toward glass. Belsie, *supra* note 47, at 9. Local governments may also resort to the use of taxes on certain types of packaging to discourage use. See Michael Lindemann, *Big Mac Chokes on Kassel Takeaway Tax*, FIN. TIMES, Aug. 24, 1994, at 2 (discussing new tax on synthetic plates and disposable cups); Stephen Kinzer, *Germany Upholds Tax on Fast-Food Containers*, N.Y. TIMES, Aug. 22, 1994, at D2 (discussing local taxes on disposable food containers).

74. Most existing plastic recycling plants use an inexpensive method of "remelting the plastic and reforming it into low value products." Fouhy, et al., *supra* note 57, at 30. This technique is also known as down-cycling because it further degrades the quality of the plastic. *Id.*

75. The thermal process is expensive. *Id.* However, German industry is presently engaged in research and development with the goal of a less expensive way to convert plastics to chemicals, like oil. *Id.* Converting plastics to oil is much more economically feasible for German industry because producing plastics is much less expensive than recycling used plastic. Belsie, *supra* note 47, at 9.

There are, as of December 1993, two facilities which convert plastics to petrochemical fuel, one in Bottrop, which converts plastic into low-grade oil, and one in Brandenburg, which converts plastic to methanol. *Id.* See also Fouhy, et al., *supra* note 57, at 30 (discussing German industries' experimentation with plastics-to-chemicals reprocessing in detail); Pierre J. Louis, *Plastic Recycled Into Oil*, EUR. PACKAGING NEWSL. & WORLD REP., Sept. 1992, at 4-5 (reporting on process developed by Fuji and Mobil); Peter Mapleston, *Chemical Recycling May Be an Option to Meet Mandated Reclaim Levels*, MODERN PLASTICS, Nov. 1993, at 58 (explaining different technologies for plastic recycling).

76. Gehring Address, *supra* note 18 (reporting results of German study indicating pyrolysis into synthetic gas offers 78% to 84% energy balance compared to 50% to 58% for incineration with energy recovery techniques).

77. Mapleston, *supra* note 75, at 58 (discussing necessity of government subsidies for chemical recycling of plastics).



## F. Proposed 1994 Amendments to the Toepfer Decree

In 1994, the German Environmental Ministry proposed changes to the packaging waste ordinance. The changes primarily address the problems DSD is having with plastic waste. First, the government revised the recycling goals for plastic waste.<sup>78</sup> Second, the government encouraged alternatives to recycling such as turning plastic waste into petrochemical feedstocks and using plastics as a reduction agent in steel processing.<sup>79</sup> Incineration is permitted only if the recycling quota, including the alternative forms, is met.<sup>80</sup> In addition, the government called for a new labeling ordinance that would require packagers to mark packaging as recyclable or disposable.<sup>81</sup> This ordinance would impose further requirements on plastic packaging.<sup>82</sup> Finally, the government imposed record-keeping requirements to insure that companies comply with the ordinance either by paying DSD or taking back material from retailers.<sup>83</sup> The Bundestag, Germany's equivalent of the House of Representatives, began consideration of these proposals after the October 1994 national elections.<sup>84</sup>

## G. Policy Fight with the European Community

The European Community is a regional intergovernmental organization comprised of twelve member states.<sup>85</sup> In October 1992,

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78. The original goal of 64% by 1996 would be revised downward to 50%, rising to 60% by 1998. Michael Rose & David Perchard, *Business and the Law: When Waste is Not Wanted - Germany's Recycling Legislation*, FIN. TIMES, Jan. 25, 1994, at 18.

79. *Id.*

80. *Id.* If quotas are not met, excess waste may be incinerated by public authorities only. *Id.*

81. The government has drafted a new labeling ordinance. This ordinance would require packagers to mark disposable packaging as recyclable, recyclable material or not recyclable. Containers that are returnable will need to be marked to inform consumers. This ordinance would impose further requirements on plastic packaging, such as requiring that the type of plastic be indicated on the package. *Id.* See also *Packaging Waste Shows Major Drop in 1993; Ministry Plans Revision to Packaging Law*, Int'l Env't Daily (BNA) No. 10280907 (Jan. 28, 1994); *German Packaging Reforms*, CHEM. WK., Feb. 2, 1994, at 14 [HEREINAFTER *German Reforms*].

82. *German Reforms*, *supra* note 81, at 14; Rose & Perchard, *supra* note 78, at 18.

83. *German Reforms*, *supra* note 81, at 14; Rose & Perchard, *supra* note 78, at 18.

84. *Green Dot System Back on Track With Innovative Plastics Recycling*, SOLID WASTE REP., Aug. 11, 1994.

85. P.S.R.F. MATHIJSEN, A GUIDE TO EUROPEAN COMMUNITY LAW 2 (1990). Member states include: Belgium, Denmark, France, Germany, Greece, Ireland, Italy, Luxembourg, the Netherlands, Portugal, Spain and the United Kingdom. *Id.* at 5-14. For a discussion of the EC's legislative process. see Michael S. Feeley &

the EC first published a proposed ordinance on packaging waste.<sup>86</sup> This proposal sought to impose high recycling rate requirements on its member countries.<sup>87</sup> The European Parliament offered over three hundred recommended amendments to the proposed directive in 1993.<sup>88</sup> In what most observers believe to be a direct attack on German policy, most European countries united at the European Environmental Council to pass a proposed waste directive.<sup>89</sup> The proposed directive sets a minimum recycling requirement of twenty-five percent of packaging materials and a maximum of forty-five percent.<sup>90</sup> This maximum feature is a new addition, designed to challenge more aggressive programs like that in Germany.<sup>91</sup> If a country desires to exceed the maximum rate, then it must be able to handle that excess through domestic recycling facilities.<sup>92</sup> However, opponents, including Minister Toepfer, vowed to fight this directive in the European Parliament.<sup>93</sup>

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Peter M. Gilhuly, *Green Law-Making: A Primer on the European Community's Environmental Legislative Process*, 24 VAND. J. TRANSNAT'L L. 653 (1991).

86. John Thornhill, *Dilemmas of the Overloaded Dustbin*, FIN. TIMES, NOV. 10, 1992, at III; EC Environmental, Health, Safety Subcommittee, Draft Proposal for a Council Directive on Packaging and Packaging Waste, Final Draft, DGXI-A4 (May 4, 1992) (on file with the *Villanova Environmental Law Journal*) [hereinafter Position Paper].

87. *Id.*

88. Interviews with industry sources.

89. Only Denmark and the Netherlands joined Germany in opposition to the proposed changes in the directive enacted in December 1993. Eisenhammer, *supra* note 28, at 37; Genillard, *supra* note 56, at 6.

90. Genillard, *supra* note 56, at 6. See also *Divided EU Agrees on Packaging Directive; Joint Ratification of Climate Change Treaty*, Int'l Env't Daily (BNA) No. 10110905 (Jan. 11, 1994) [hereinafter *Divided EU*].

91. The French proposed this maximum level feature to prevent Germany from continuing to flood the market. *Threat of Split In Union Looms in Talks on Packaging Directive*, Int'l Env't Daily (BNA) No. 3410902 (Dec. 7, 1993) [HEREINAFTER *Threat of Split*].

92. Eisenhammer, *supra* note 28, at 37. See also *Divided EU*, *supra* note 90; *Threat of Split*, *supra* note 91 (noting Britain proposed provision modifying upper cap following Commission approval).

93. Eisenhammer, *supra* note 28, at 37. The German government also threatened legal action if unsuccessful at Parliament. Germany made two primary arguments. First, the EC directive violates the Treaty of Rome's free trade requirements by restricting the cross-border trade of "secondary raw materials." Second, Article 100(a)(4) of the Treaty of Rome permits national schemes that seek to protect the environment. Genillard, *supra* note 56, at 6; Rose & Perchard, *supra* note 78, at 18. The French-British dominated European Commission argues that the European Parliament can limit member countries' packaging recovery plans when those plans would create market distortions in the European Union. *Commission to Take Germany to Court Over Packaging Law, Paleokrassis Says*, Int'l Env't Daily (BNA), Mar. 1, 1994.

This illustrates difficulties in interpreting the laws governing European unification. The EC was originally conceived as an economic organization only. The 1957 Treaty of Rome did not discuss environmental issues until it was amended in

Germany and its allies succeeded in their efforts when the proposed directive went to committee in the European Parliament. The Parliament's Environment Committee, considering the proposed directive earlier last year, removed the upper limit provisions.<sup>94</sup> The full Parliament began considering the directive in May, offered amendments, and returned it to the European Environment Council.<sup>95</sup>

This debate illustrates the deep divisions in the European Union ("EU") concerning environmental policy.<sup>96</sup> The Germans and their allies, namely Denmark and the Netherlands, are currently in a minority position.<sup>97</sup> However, in June 1994, Belgium joined the three "green" countries and elevated the group's status to that of a blocking minority.<sup>98</sup> Future prospects for Germany are improved since the Germans recently took over the EU presidency and, in 1995, three additional countries will join the EU.<sup>99</sup> These countries may join with Germany in pushing for strict environmental laws.<sup>100</sup> Meanwhile, the Parliament and Council work to resolve the differences among the rival positions. This leaves the EU without a common regulatory scheme, thereby continuing the present national programs.

#### H. Product Take-Back Legislation

Despite the many problems with the Toepfer Decree and its packaging take-back scheme, the German government is considering expanding the system to electronic products, appliances and

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1987 by the Single European Act. The 1992 Treaty of European Union, known as the Maastricht Treaty due to its place of signing in Maastricht, Netherlands, furthers the move to union and expressly addresses environmental issues. See *Making the Change From Waste Disposal to Recycling: Environmental Policy in the European Community*, MUNICIPAL AND INDUSTRIAL WATER POLLUTION CONTROL, June 1993, at 16.

94. *Committee Scraps Upper Limit On Packaging Waste Recovery*, Int'l Env't Daily (BNA), April 26, 1994.

95. *Id.*; *Packaging Directive Set to Encourage Power From Waste*, EC ENERGY MONTHLY, June 1994.

96. The European Community officially became the European Union when the Maastricht Treaty came into force on November 1, 1993.

97. Divisions arise from the requirement under the Maastricht Treaty that environmental measures must be passed by a qualified majority with each member state awarded votes according to population. See *Threat of Split*, *supra* note 91.

98. See Diana Bentley, *Business and the Law: Bit of a Mess Over Waste-Disappointed For The EU Packaging Industry and Environmentalists*, FIN. TIMES, Aug. 30, 1994, at 9; David Gardner, *New Row in Prospect Over EU Recycling Proposals*, FIN. TIMES, June 10, 1994, at 2.

99. These countries include: Austria, Finland and Sweden.

100. *Id.* However, the Scandinavian countries have large forestry industries whose exports of virgin paper products could be harmed by schemes like that in Germany.

automobiles.<sup>101</sup> The German Environmental Ministry prepared a draft "Regulation on the Avoidance, Reduction and Utilization of Wastes From Used Electrical and Electronic Equipment," in 1991.<sup>102</sup> The proposed law would apply to a range of electronic products.<sup>103</sup> For instance, a company selling electronic products would be obligated to take back similar equipment from the customer at the time of sale or delivery.<sup>104</sup> These companies would also be required to take back products of their own brand at any time.<sup>105</sup> Finally, companies must file reports with the German government disclosing how the company disposed of waste materials taken back from customers.<sup>106</sup>

The German government believes that expanding the take-back obligation to products is a natural outgrowth of the packaging ordinance and its goal of internalizing waste disposal costs.<sup>107</sup> Nevertheless, difficulties with the packaging waste program and Germany's current economic condition have led German officials to acknowledge that a product take-back requirement may still be a decade away.<sup>108</sup>

An alternative means of encouraging product take-back is being developed from a government-industry "Blue Angel" program.<sup>109</sup> This program allows companies to submit products for approval to carry a "Blue Angel" designation. This marking signifies that the product is environmentally friendly. The program

101. The European Community is also studying the issue of product take-back, focusing on electrical and electronic products. The French government is also looking at this issue. See Study Report on Valorization of Electrical and Electronic Products (1992) (English translation on file with author).

102. Regulation on the Avoidance, Reduction and Utilization of Wastes From Used Electrical and Electronic Equipment, (draft 1991) [hereinafter Electronic Waste Regulation] (English translation on file with author).

103. Targeted products include: consumer electronics, office equipment, tools, toys, clocks, watches and medical equipment. *Id.* § 3.

104. *Id.* § 4(1).

105. *Id.* § 4(2).

106. Electronic Waste Regulation, *supra* note 102, § 5.

107. Cairncross, *supra* note 35, at 38 ("For Klaus Toepfer, packaging is merely the guinea pig: taking back and recycling will be extended to other industries.").

108. Gehring Address, *supra* note 18 (noting product take-back requirement is "not just around the corner," but a decade away).

109. The environmental ministers of several German states created the program in 1978, which, in 1986, became a national program administered by the Federal Ministry for the Environment, Natural Conservation and Nuclear Safety, in association with three private standard-setting organizations. By 1991, over 3,000 products carried the label. See *Germany: Environmental Certification Program*, ENVIRONMENTAL PACKAGING, Oct. 1992, at 141; Rolfes, *supra* note 17, at 49; Kate Trollope, *European Community Exerting Pressure For Green Labeling*, SUPERMARKET NEWS, Apr. 1, 1991, at 2.

charges companies application and license fees to use the label.<sup>110</sup> The criteria for the marking differs by product, but can include requirements that the manufacturer have a collection program in place.<sup>111</sup> The "Blue Angel" program is proving to be popular with retailers and consumers. If this trend continues, it could lead to a market-driven demand for product take-back.<sup>112</sup>

#### IV. LESSONS LEARNED

Despite operating for only three years, the German packaging waste system, like other experiments, has provided a wealth of information for review by those interested in the different policy options for dealing with solid waste issues.

##### A. Supply Does Not Equal Demand

The German system has been remarkably successful at collecting waste materials. This experience is shared, although perhaps not as dramatically, by municipal collection programs in various parts of the United States.<sup>113</sup> While building up a supply of waste materials is a relatively simple matter, disposal of the waste is not. When landfills or incinerators are not available, authorities may be forced, as the Germans have been, to dispose of these materials in less appropriate locations or simply to store the materials.

The German government believed that demand for recycled materials would develop because of the operation of markets, led by consumer demand, for packaging and products made with recycled materials.<sup>114</sup> Since consumers have no incentive, beyond

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110. ENVIRONMENTAL PACKAGING, *supra* note 109, at 141.

111. *Id.* at 141; Trollope, *supra* note 109, at 2. For example, computer products are judged on factors relating to energy efficiency, non-use of certain flame retardant substances, battery and material labeling, and commitment to take-back and recycle the product.

112. The EC has a similar "Ecolabel" program. Each country will appoint a national body that will grant companies the right to use the Ecolabel. Criteria for different products are being created. For example, the criteria for washing machines and dishwashers focus primarily on consumption of energy, water and detergent. See *U.K. Blames Other EC Members For Delays in Ecolabelling Program*, Int'l Env't Daily (BNA) July 9, 1993 (listing many products included in program).

113. See, e.g., Frank Allen, *Piling Up, As Recycling Surges, Market for Materials is Slow to Develop*, WALL ST. J., Jan. 17, 1992, at A1 ("The supply side of America's recycling revolution has been growing at an explosive rate, but the demand side is barely under way.").

114. The German's follow the "polluter pays" concept. The idea is that companies will then have a financial incentive to not produce excess waste. Companies will pass these costs on to consumers by charging more for products packaged in excess material. Consumers, facing higher prices for these goods, will then choose more environmentally-favorable products.

their own personal commitment, to demand less packaging and/or recycled content in packaging, the system may encourage wasteful practices. Consumers, who could be charged based on how much they throw away, instead can avoid costs by using specified collection bins.

## B. Plastics Pose a Special Problem

The German government imposed an impossible burden on DSD and the dual system. The recycling goals, mandated by law, were not based on realistic assessments of technical and economic facts, but rather on ideology. High goals may be reasonable for materials like aluminum and steel where recycling is technically and economically practical, but such goals are not practical for materials like plastics.

Plastic packaging materials are difficult and expensive to recycle. Because different resins cannot be mixed, the materials must be sorted and processed separately. This labor intensive process increases costs considerably. Additionally, with petroleum prices at depressed levels, it is difficult for recycled materials to compete with virgin plastics that can be produced cheaply from oil and natural gas feedstocks.<sup>115</sup> Furthermore, even when prices for recycled materials are favorable,<sup>116</sup> many companies cannot use recycled plastic because it is of lower quality and consistency than virgin material.<sup>117</sup> Additionally, recycled materials have limited uses in packaged food and pharmaceutical products, which are significant markets for plastic packaging.<sup>118</sup> The German government has not been able to successfully address these difficult market realities.

Although this lesson was obvious to those who examined the issues objectively, the German experiment made the matter dramatically clear. The lesson for policymakers is simple: significant recycling of plastics is probably not a realistic policy goal. The reasonable position is to consider alternative disposal methods for

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115. See Emma Chymoweth & Elizabeth Kiesche, *Recycling in Fits and Starts; Harsh Economic Realities Force Consolidation*, CHEMICAL WEEK, Oct. 28, 1992, at 46.

116. Many industry analysts believe that virgin resin prices will be increasing over the next few years. This should lead to an increase in prices for post-consumer materials as well. See Robert D. Leaversuch, *Recycling Faces Reality as Bottom Line Looms*, MODERN PLASTICS, July 1994, at 48D (providing data on plastics recycling).

117. See Reynolds, *supra* note 7, at 334-37.

118. Government regulations generally limit the use of recycled material in food and drug packaging. This is true in the United States and most European countries. In Europe, food and pharmaceutical products account for 45% of all plastic packages. Louis, *supra* note 69, at 3.

plastics. The alternative, banning or restricting their use, would be foolish.

### C. Supply Side Efforts Can Be Expensive

The true cost of aggressive government recycling mandates is just now beginning to become obvious. Where recycling is economically viable, as it is with aluminum and steel materials, because of the high value of raw materials and the relatively low costs of processing, and where low processing costs and decent markets make recycling feasible, government mandates can push industries forward to reduce packaging waste without enormous economic disruptions. However, when recycling faces higher technical and economic barriers, as it does with plastics, government mandates may create enormous disruptions.

For Germany, this means that DSD must dramatically increase its costs for accepting plastic packaging. Furthermore, if DSD cannot handle the flow of plastic materials, pressure will mount on government to assist the system by banning such packaging materials.<sup>119</sup> The potential result would be reduced options for packaging and limited consumer choice, with possible increased costs. Plastic containers for beverages and other products serve a valuable function in modern society. Therefore, government policies that lead to de facto or de jure prohibitions on plastic materials are severely misguided.

### D. The Need for a Balanced Approach

One weakness of the German system is that its mandated goals are based on ideology and not on facts. The dominant ideology is that recycling is inherently virtuous and should be pursued for its own sake. The German experiment shows that this is an expensive course and that recycling is not the only answer. Modern societies will continue to produce and will need to dispose of waste materials. At the present time, and perhaps for a long time into the future, we will have to use landfills, incinerators and other proven methods of disposal. If performed properly, landfilling, incineration and recycling can be environmentally safe and contribute to society. Recycling turns waste into raw materials. Landfills, in some cases, can be tapped for fuel and converted for recreational and

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119. In an address to an organization of packaging professionals, Dr. Gehring warned that the failure of DSD could lead German environmentalists to advocate banning plastic packaging materials. See generally Gehring Address, *supra* note 18.

other uses.<sup>120</sup> Incinerators can be utilized to recover energy created by burning wastes.<sup>121</sup> In fact, many countries with strong ecological records incinerate the vast majority of their household waste.<sup>122</sup> Thus, as illustrated, recycling is just one part of the solution, not a panacea.

### E. The Role of Innovations in Packaging Materials

Modern industrial society produces a complex variety of packaging configurations made from a multitude of materials. This is properly seen as a positive attribute of an innovative society. Packaging is necessary for society to transport, protect, store and market products. A simple but important example illustrates the advantages of these materials. In less developed countries, most food and beverage products are sold locally and often are only available seasonally. Today, due in large part to packaging innovations, barriers of distance and duration are mitigated. While there may be more packaging waste, there is less food spoilage and a greater variety of options.<sup>123</sup>

Government policy should encourage innovation in packaging designs and uses. As seen in the past, companies respond to higher fees and consumer demand by designing new packaging configurations with a goal of using less material.<sup>124</sup> However, care should be taken not to over-emphasize recyclability. A company may decide that it needs to replace reduced-sized packaging with a container that, although larger, is made of more easily recycled material. Packaging made of plastic material, which generally takes up less room in landfills and allows designers to reduce the amount of ma-

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120. See Reynolds, *supra* note 7, at 337-38; Michael Valenti, *Tapping Landfills For Energy*, MECH. ENG., Jan. 1992, at 44 (noting 100 landfills in the United States operating gas-to-energy plants); William Young, *A Tree Grows on Fresh Kills*, GARBAGE: THE INDEPENDENT ENVIRONMENTAL QUARTERLY, Summer 1994, at 60 (describing conversion of New York landfill into wildlife corridor).

121. See Reynolds, *supra* note 7, at 346 n.113.

122. Sweden and Switzerland, for example, incinerate 70% to 80% of their domestic waste. Louis, *supra* note 69, at 1-2. Singapore incinerates approximately 85% of its waste. Pierre J. Louis, *Packaging and Environment in the Southeast Asian Countries and Japan*, EUR. PACKAGING NEWSL. & WORLD REP., Nov. 1992, at 1, 4.

123. See Brian Blunden, *Developing Environmentally Acceptable Packaging*, Address at the Financial Times Conference on International Packaging and the Environment (Mar. 23, 1992), at 6.1-6.4 (transcript available from Financial Times Conference Organization); Hans Rausing, *Future Prospects for International Packaging*, Address at the Financial Times Conference on International Packaging and the Environment (Mar. 23, 1992), at 9.1-9.4 (transcript available from Financial Times Conference Organization).

124. See Reynolds, *supra* note 7, at 337 n.67.



material used in the package, could be replaced.<sup>125</sup> Composite materials, which are extremely difficult to recycle, may offer benefits as well, but could also suffer in a recycling system.<sup>126</sup>

If recycling is to play a larger role in solving waste disposal problems, current technology must improve. For example, one major problem is sorting material. Basic sorting plants use gravity and magnetics to separate metals from plastics, and glass from paper. It is far more difficult to separate different plastic resins from each other. One technique is to use an x-ray sorting system that can distinguish between PET and PVC bottles.<sup>127</sup> These types of technology innovations, if cost-effective, may increase the usefulness of recycling programs.

#### V. IS A GREEN DOT IN THE UNITED STATE'S FUTURE?

Many policymakers and commentators in the United States are seeking to resolve problems associated with nonhazardous waste disposal. Congress has been debating reauthorization of the Resource Conservation and Recovery Act ("RCRA")<sup>128</sup> since 1992. While previous attempts to add recycling components to this law have failed,<sup>129</sup> some groups will seek to add recycling mandates to RCRA.<sup>130</sup> To many people, the German system has an immediate and simplistic appeal. In theory it forces the industry to think

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125. The evolution of Clorox bleach bottles illustrates the material source reduction benefits of plastics. In the early 1960's Clorox made its bleach bottles of three and one half pounds of glass. During that decade the company converted to plastic bottles, using only four ounces of material. In 1993, Clorox bottles have been further reduced to use thirty percent less plastic. Interview with Terry Bedell, Environmental Packaging Manager, The Clorox Company, Address at CONEG Challenge Workshop, July 15, 1993 (notes on file with the author).

126. A good example is packaging of coffee. Traditionally, companies packaged coffee in steel cans. In recent years, new technology led to the development of a composite plastic-aluminum container for packaging coffee, called a "brick-pack." According to Proctor & Gamble Co., this package uses eighty percent less material and has other benefits, but is not recyclable due to its composite nature. Steel cans, although using much more material, can easily be recycled both technically and economically. See Boerner & Chilton, *supra* note 50, at 6.

127. Fouhy et al., *supra* note 57, at 30.

128. Resource Conservation and Recovery Act, §§ 3001-5006, 42 U.S.C. §§ 6921-56 (1988 & Supp. V 1993).

129. Numerous bills were introduced in 1992. See Reynolds, *supra* note 7, at 356. No bill made it to the floor of either the House or Senate. See *Second Congressional Session Ends, Leaving Decisions for Next Congress*, Daily Rep. for Executives (BNA), No. 199, at C1 (Oct. 14, 1992), available in LEXIS, Nexis Library, DREXEC File.

130. The Congressional Research Service estimates that Congress will likely wait until 1997 before again debating RCRA reauthorization. See *German's Polluter Pays Concept Could Be Applied to U.S. Industry*, Int'l Env't Daily (BNA), Apr. 13, 1994.

about disposal issues, while not formally banning the use of certain materials or packaging configurations. Many commentators, and certainly German government officials, present the system as a moderate solution that avoids the extremes of excessive government interference and ineffective reliance on market forces alone.<sup>131</sup>

There are many similarities between Germany and the United States. Both are modern, industrial, consumer societies.<sup>132</sup> Environmentalist political movements and environment-oriented consumers have a strong influence on both countries' market trends and policy decisions. Some regions of the United States, including the northeast, resemble Germany in the concentration of population and access to industrial facilities.

However, the two countries also differ in many ways. The United States is a much larger country, with many regions featuring very low population densities, great distances and a lack of industry. The American people are a younger culture, with a stronger sense of individual freedom and personal autonomy. The United States' economy is also more market oriented with the role of government reduced by comparison. Additionally, the presence of vast natural resources in the United States means cheaper access to materials such as paper, metals and plastics.<sup>133</sup>

These differences present real problems for importing the German system to this country. A massive national collection plan makes little sense in a country which has regions with great distances between population centers and industrial facilities that could process and utilize materials. The increased transportation burden of such a plan would dramatically drive up costs<sup>134</sup> and increase levels of air pollution from exhaust.<sup>135</sup> In many parts of the United States, air pollution due to vehicle exhaust is a greater pub-

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131. *See id.*

132. For a discussion of German industrial history, see Pächter, *supra* note 13.

133. Germany has relatively few natural resources, except for excellent coking coal deposits. Germany is also burdened by relatively high energy costs.

134. One source estimates that a green dot system in the United States could cost eighteen billion dollars annually. E. Gifford Stack, *Green Dot Not For U.S.: Germany's Packaging Law Doesn't Make Sense Here*, BEVERAGE INDUSTRY, Sept. 1993, at 50.

135. Critics of the German system and its "obsession of recycling at all costs" note that airfilling may be replacing landfilling. Sims Address, *supra* note 19, at 7.7. *See also* Lodge & Rayport, *supra* note 1, at 128, 136 (noting increase in air pollution in Los Angeles due to recycling because "to introduce recycling collection in Los Angeles, the city had to add 600 diesel trucks to the 1,000 truck fleet already in operation.").

lic health concern than waste disposal.<sup>136</sup> In addition, the comparatively cheaper cost of virgin materials in the United States would lessen the value of waste materials, further threatening the financial viability of an American dual system.

The German system suffers from problems that are visible in its operation. The German government's imposition of unrealistic recycling targets and the nation's unwillingness to use landfilling and incineration create an impossible burden on DSD. United States policymakers should not repeat this mistake. In fact, the United States is managing its waste disposal problem reasonably well. Numerous experiments, both public and private, have increased the rate of recycling for many packaging materials, and for some products, increased rates to respectable levels.<sup>137</sup> Landfilling and incinerating are used as part of the solution.<sup>138</sup> These techniques are employed, in large part, through regional efforts and not through a centralized national program. Thus, this largely market-driven system, supplemented with generally modest federal, state and local initiatives, is working.

## VI. A REVIEW OF ALTERNATIVES TO THE GERMAN SYSTEM

Several countries have adopted variations on the German theme. The existing French system and a proposed Canadian system should be examined by policymakers interested in the German

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136. Many cities are facing tough restrictions on business development for non-attainment of Clean Air Act requirements. In these areas air pollution is both a critical public health and economic issue. See also Patricia Poore, *Is Garbage an Environmental Problem?*, GARBAGE: THE INDEPENDENT ENVIRONMENTAL QUARTERLY, Nov.-Dec. 1993, at 40 (arguing that garbage disposal is not a real health issue); Faye Rice, *Next Steps for the Environment*, FORTUNE, Oct. 19, 1992, at 98 (discussing environmental impact of businesses policing themselves).

137. According to EPA, industry recycled between 15% and 20% of municipal solid waste in 1992, up from 6.7% in 1960. Boerner & Chilton, *supra* note 50, at 6. While the present figure is close to 20%, EPA hopes to meet an unlikely goal of 25% in 1995. *Germany's Polluter Pays Concept Could Be Applied to U.S. Industry*, Int'l Env't Daily (BNA), Apr. 13, 1994. Some specific product and material types illustrate well above average levels of success. Seventy five to eighty percent of the weight of the average automobile is recycled. Daniel Holt, *Recycling and the Automobile*, AUTOMOTIVE ENG., Oct. 1993, at 42. Over 40% of soft drink bottles made of PET were recycled in 1992. Fouhy et al., *supra* note 57, at 30. See also David Biddle, *Recycling For Profit: The New Green Business Frontier*, HARV. BUS. REV., Nov.-Dec. 1993, at 145, 148-56.

138. For a discussion of municipal solid waste disposal, see *supra* notes 1-3 and accompanying text. States relying heavily on incineration as a form of waste disposal include Connecticut (65% of waste incinerated) and Massachusetts (48% of waste incinerated). See Scott Allen, *Initiative Backers Cite High Incineration Rate*, BOSTON GLOBE, Oct. 7, 1992, at 36.

model. The systems are more realistic and more easily adaptable to the United States.

### A. Dual System Lite

While German waste export policies have enraged many neighboring countries, this has not kept them from considering variations of the German dual system for implementation in their own countries. Several smaller European nations, such as Belgium and Austria, created industry-run collection systems to supplement existing waste collection systems and use a green dot symbol for acceptable packaging materials.<sup>139</sup>

The French system of recycling may be labeled "dual system lite" because of several differences between it and the German system. With the approval of the government, French industry created an organization called Eco Emballage.<sup>140</sup> Eco Emballage licenses a dot symbol for packaging materials to companies that pay a licensing fee. They also accept packaging bearing the German green dot, and entered into a reciprocal agreement with DSD so that the German system will accept Eco Emballage-labelled packaging.<sup>141</sup> There are two major differences between Eco Emballage and DSD. First, Eco Emballage does not collect waste. The French did not want to create a duplicative collection infrastructure, so Eco Emballage merely provides subsidies to local municipalities that continue to be responsible for waste collection.<sup>142</sup> Second, the French have not attempted to prohibit landfilling and incineration of waste in favor of a recycling program.<sup>143</sup> In fact, Eco Emballage's recycling goals are realistic.<sup>144</sup>

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139. Belgium adopted its system, called Fost Plus, in 1993. They are negotiating reciprocity agreements with Germany and France. Austria's system is similar. *Decree Requires Mandatory Recycling of Packaging Materials in Late 1993*, Int'l Env't Daily (BNA) (Oct. 14, 1992), available in LEXIS, Nexis Library, BNAIED File.

140. See Pierre J. Louis, *Packaging Trends in France*, EUR. PACKAGING NEWSL. & WORLD REP., Mar. 1992, at 1-3; Reynolds, *supra* note 7, at 345-46.

141. Pierre J. Louis, *Packaging Waste in the Unified Europe*, EUR. PACKAGING NEWSL. & WORLD REP., Aug. 1992, at 1, 2.

142. Fouhy et al., *supra* note 57, at 30; Rose & Perchard, *supra* note 78, at 18.

143. Fouhy et al., *supra* note 57, at 30 (stating France incinerates for energy approximately 40% of its plastic packaging waste); Rose & Pritchard, *supra* note 78, at 18. See also *French Package Waste Plan Limits Recycling*, MODERN PLASTICS, Dec. 1993, at 13 (adding remaining waste landfilled).

144. At first, Eco Emballage will focus only on plastic bottles and aim for a recycling rate of 20% by 1996. By the year 2000, they will expand to focus on all consumer plastic packaging, with a 20% goal. *French Package Waste Plan Limits Recycling*, MODERN PLASTICS, Dec. 1993, at 13.

An industry coalition in Canada proposed employing a system similar to that of France. The Grocery Products Manufacturers of Canada proposed to create the Canadian Industry Packaging Stewardship Organization ("CIPSO").<sup>145</sup> This proposal would establish an organization to license a symbol to companies that introduce packaging into Canada. It also follows the French lead in subsidizing, rather than supplementing, local waste collection activities.<sup>146</sup> The plan is to be applied nationally, but will be implemented on a province-by-province basis. In July 1993, Manitoba province announced a program based on the CIPSO model.<sup>147</sup> Some of the fees raised will be rebated back to participating companies to reward those who reduce the volume of packaging they use. Other rebates will reward companies that use recycled materials in their packaging.<sup>148</sup>

## B. Demand Stimulation

A variety of federal and state legislative initiatives have been taken in the United States in an attempt to prompt demand for waste materials as a production input.<sup>149</sup> When realistically crafted, these initiatives may offer incentives to move industry towards greater use of recycled materials. A common strategy is to modify federal and state procurement policies to encourage the purchase of products made from recycled materials, such as stationary and construction materials.<sup>150</sup> Government purchasing offices have always balanced cost-quality decisions with social policy mandates, so this strategy does not create a major change in procedure.<sup>151</sup> Since government agencies are sizable purchasers of products, this should prove to be effective.

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145. This effort began in response to the adoption in 1990 by the Canadian Council of Ministers of the Environment ("CCME") of a National Packaging Protocol. See CCME, *Packaging Audits and Packaging Reduction Workplans: Guidelines to Help Industry Meet the Goals of the National Packaging Protocol*, June 1992 (available from the CCME Secretariat). The Protocol seeks to reduce packaging waste generation by 50% by the year 2000. *Id.* It also establishes specific targets for different industry sectors. *Id.*

146. Isaacs, *supra* note 69, at 10.

147. *Id.*

148. *Id.*; Boerner & Chilton, *supra* note 50, at 6 n.8.

149. See Reynolds, *supra* note 7, at 348-56 (describing programs).

150. See, e.g., Environment, Pennsylvania, Maryland, Kentucky Lead in Recycled Paper Purchases, Survey Finds, Daily Rep. for Executives (BNA), No. 205, at A14 (Oct. 22, 1992).

151. For example, government purchasing policies often have created preferences for minority groups to promote equal opportunity goals.

Another approach is to enact legislation that forces product and packaging manufacturers to use some amount of recycled material. While neither the federal government nor any state government has enacted "across the board" recycled content requirements, or "rates and dates," legislation,<sup>152</sup> several states have applied these concepts to certain products and packaging types. Many states require the use of recycled paper in phone books<sup>153</sup> and newspapers.<sup>154</sup> Three states enacted laws that will soon require manufacturers of products packaged in rigid plastic containers to use recycled plastic material.<sup>155</sup> A range of industry and government-industry cooperative activities are working to stimulate a demand for recycled materials.<sup>156</sup>

## VII. A PROPOSAL FOR UNITED STATES POLICYMAKERS

Congress should allow private and state experimentation to continue and not legislate a national recycling program.<sup>157</sup> The federal government has taken some steps toward this policy goal. On October 20, 1993, President Clinton issued an executive order to promote federal government purchases of products made with recycled materials.<sup>158</sup> Similarly, the Environmental Protection

152. In 1992, Massachusetts voters rejected a proposal that would have applied a 25% recycled content requirement by 1996 to all packaging sold in the state. See Reynolds, *supra* note 7, at 352-54. A similar resolution is currently being debated in the New York State legislature. Boerner & Chilton, *supra* note 50, at 6.

153. Five states, namely California, Connecticut, Maryland, Oregon and Wisconsin require recycled content in phone books. Boerner & Chilton, *supra* note 50, at 6. See e.g., OR. REV. STAT. § 459A.500-.740 (1991) (stating phone directories must have 25% recycled content by weight, of which 15% must be post-consumer waste).

154. As of January 1993, twenty-four states impose minimum content requirements on newspaper. Boerner & Chilton, *supra* note 50, at 6. See e.g., OR. REV. STAT. § 459A.500-.740 (stating newspaper must be 7.5% recycled content by 1995).

155. See Wis. STAT. ANN. § 100.297 (West Supp. 1993) (requiring 10% recycled content by 1995); OR. REV. STAT. § 459A.500-.740 (requiring 25% by 1995); CAL. PUB. RES. CODE § 42301 (1991) (requiring 25% by 1995).

156. See Reynolds, *supra* note 7, at 330-38, 354-56; David Biddle, *Recycling For Profit: The New Green Business Frontier*, HARV. BUS. REV., Nov.-Dec. 1993, at 145. One recent effort is a plan by the Chicago Board of Trade to establish an electronic trading system for many post-consumer materials. W. B. Crawford, *CBOT Eyes Market for Recyclables*, CHICAGO TRIBUNE, June 10, 1993, at B1. In order to enable traders to value materials, the industry would need to come up with quality standards. *Id.* This could encourage manufacturers to consider using recycled materials. Ultimately, the system could become a full-fledged futures trading system which would help stabilize the prices of materials. Electronic trading in recycled PET and HDPE plastics will begin later this year. Robert D. Leaversuch, *Recycling Faces Reality as Bottom Line Looms*, MODERN PLASTICS, July 1994, at 48D.

157. See Reynolds, *supra* note 7, at 357-60.

158. Executive Order on Federal Acquisition, Recycling, Waste Prevention, Exec. Order 12873, Oct. 20, 1993, reprinted in, Daily Exec. Rep. (BNA), No. 202 (Oct. 21, 1993), at M1. Under this Executive Order, federal procurement offices

Agency ("EPA") proposed modifications to regulations permitting collection plans for rechargeable batteries.<sup>159</sup>

### VIII. CONCLUSION

The German experiment, in creating a government-mandated recycling system administered and run by a private entity, illustrates both the strengths and weaknesses of government intervention in markets. The scheme has influenced the use of packaging materials by encouraging companies to use less. It has prompted industry to work to develop creative packaging alternatives, perhaps on a quicker timetable than the market would have prompted. Finally, it appears to encourage development of innovative technologies for sorting and processing waste materials for recycling, and may promote the development of advanced technologies for converting plastic waste into usable fuels. However, Germany's program achieved these benefits at a significant financial cost and with an uncertain impact on the environment.

As policymakers search for answers to the nonhazardous waste disposal problem and seek to encourage recycling and other techniques, they should keep in mind the primary lesson of the German experiment: government policies cannot erase technical and economic realities, they can only influence them or be broken by them. The German government ignored the technical and economic realities of recycling plastic materials and imposed unrealistic goals which nearly bankrupted their program. The answer to the question of how to develop a sound public policy that encourages recycling, reduces waste, and ensures a clean environment and a healthy economy, is one that incorporates technical and economic realities. Government can play a leading role in shaping this environmental policy, but its role must be realistic. State and re-

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will need to implement programs to give preference to "environmentally preferable products." *Id.* It also requires EPA to issue guidelines to assist agencies. *Id.* Another potentially valuable feature of the order is that it requires the National Institute of Standards and Technology ("NIST") to develop and publish test standards for products. These standards could pave the way for the adoption of industry standards in the commercial arena. If so, then this Order would have an enormous impact on the development of markets for recycled materials. *See, e.g.,* Lynn Bergeson, *Clinton Executive Order May Create More Green Products*, CORP. LEGAL TIMES, Feb. 1994 (reporting some industry groups believe regulations and guidelines should have been prepared through administrative rulemaking procedures affording opportunities for notice and comment).

159. *See* 58 Fed. Reg. 8102 (1993) (to be codified at 40 C.F.R. pts. 260, 261, 262, 264, 265, 268, 270, 273) (proposed Feb. 11, 1993). Under the proposed rule changes, batteries would not be subject to RCRA subtitle C regulations for hazardous waste. *Id.* A final rule is expected by January 1995.

**gional authorities should continue to experiment, while keeping in mind the importance of maintaining a national marketplace. Legislation which seeks to stimulate demand for recycled products, created with industry input, may further the use of recycled materials without affecting the normal function of markets.**



