Packaging, Environmentally Protective Municipal Solid Waste Management, and the Limits to the Economic Premise

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INTRODUCTION

Garbage, particularly household waste, is a pervasive reminder of our relationship to the environment. It sits in our kitchens, occasionally blows down the street, and is usually buried or burned not far from our homes.

The cost of managing municipal solid waste (MSW)—the term environmentalists, economists, and scientists often use for nonhazardous waste—is increasing. In 1992, MSW disposal cost the United

1. The congressional Office of Technology Assessment defines "municipal solid waste" as that portion of "solid waste generated at residences, commercial establishments . . . and institutions." OFFICE OF TECHNOLOGY ASSESSMENT, U.S. CONGRESS, OTA-O-424, FACING AMERICA'S TRASH: WHAT NEXT FOR MUNICIPAL SOLID WASTE? 4 (1992) [hereinafter OTA REPORT]. More specifically, the United States Environmental Protection Agency (EPA) defines "MSW" as "durable goods, nondurable goods, containers and packaging, food wastes, yard wastes, and miscellaneous inorganic wastes from residential, commercial, institutional, and industrial sources." OFFICE OF SOLID WASTE AND EMER-
States approximately $30 billion; in 1995, it will cost $45 billion. This increase is due largely to the tension between two trends. First, the amount of MSW produced in the United States is growing. Residents of the United States now generate an estimated 180 million tons of MSW annually, and per capita MSW production is rising by at least 0.5% per year. Second, broadening health, environmental, and other public concerns associated with the components of integrated solid waste management—landfilling, incineration, and recycling—have ensured that the per-ton costs of MSW disposal options are also increasing.


3. In 1988, 180 million tons of MSW were generated in the United States, at an equivalent rate of four pounds of garbage per person per day. CHARACTERIZATION OF MUNICIPAL SOLID WASTE, supra note 1, at ES-3. To put that figure in perspective, the average American generates over 250% more garbage than the average European. See Bette K. Fishbein, European Packaging Initiatives: Leading the Way on Source Reduction, RESOURCE RECYCLING, Mar. 1992, at 86, 94.

4. Waste and the Environment: Misunderstood Mess, ECONOMIST, May 29, 1993, Survey section, at 4; see also OTA REPORT, supra note 1, at 77 (estimating that United States per capita MSW generation increased 0.7% per year between 1970 and 1988).

5. Integrated solid waste management treats different components of the MSW stream with different technologies. JOHN SCHALL, DOES THE SOLID WASTE MANAGEMENT HIERARCHY MAKE SENSE? 1 (1992) (Program on Solid Waste Policy, Yale University School of Forestry and Environmental Studies Working Paper No. 1) [hereinafter SCHALL PAPER No. 1]. Determining which technologies are best in a given context gives rise to much controversy. Id. On the one hand, many people support a "menu of options" plan, which theoretically allows MSW managers to pick the management technology best suited to the municipality in question. Id. On the other hand, proponents of the waste management hierarchy point to burgeoning economic and environmental data that support prioritization of options. Id.

Generally, the following ranking of management strategies is considered both the least expensive and the most environmentally benign: (1) maximize MSW reduction at the source, and reuse recoverable material whenever possible; (2) maximize the amount that can be recycled or composted; and (3) incinerate the remaining solid waste and landfill the residue. See id. at iii. EPA expresses no preference between landfilling and incineration. OFFICE OF SOLID WASTE AND EMERGENCY RESPONSE AND OFFICE OF WATER, U.S. ENVTL. PROTECTION AGENCY, EPA/530-SW-89-051, METHODS TO MANAGE AND CONTROL PLASTIC WASTES: REPORT TO CONGRESS 4-1 (1990). On the other hand, the state of Maine ranks incineration above landfilling in its six-part waste management hierarchy: (1) source reduction, (2) reuse, (3) recycling, (4) composting, (5) incineration, and (6) land disposal. ME. REV. STAT. ANN. tit. 38, § 2101(1) (West Supp. 1994).

6. For example, landfills traditionally accounted for almost 75% of all MSW disposal, but many are reaching capacity, various economic and political forces have made it hard to establish new landfills, and tipping fees have been increasing. H.R. REP. No. 839, 102d Cong., 2d Sess. 61 (1992). Also, opposition to the construction of new incinerators remains vociferous. See id. at 61-62. Finally, recycling, although enthusiastically supported, has yet to become a widely used source of MSW management cost reduction. See id. at 63. For a more detailed discussion of these concerns, see discussion infra part I.B.2.
Packaging, in particular, which has come to represent both the ease and the wastefulness of modern consumer society, has risen to great importance in the MSW disposal discussion. Although modern packaging allows products to remain intact and uncontaminated for much longer than was possible even in the recent past, packaging also represents the single largest component of the MSW stream. Currently, 90% of all packaging is discarded, usually immediately after purchase. Because packaging management provides a potent example of the subtle issues of environmental management, and because it reflects the connection between one of the most commonplace of human activities (producing MSW) and the environmental consequences of that action, the management of product packaging is a particularly useful focus for a discussion of the environmental impacts, economic realities, and human dimensions of MSW management.

This article discusses the challenge of MSW management in the United States, with a special focus on the role of packaging. It then explores a number of approaches to reducing packaging waste. These can broadly be divided into regulatory tools, economic tools, and combinations of the above, including informational tools. Based on the relative merits and drawbacks of these approaches, we then suggest a framework for assessing MSW management strategies that links consumers and the choices they make to the packaging waste that ultimately results from those choices. Finally, we assess packaging management initiatives in the United States and Europe from the perspective of this framework.

I
PRODUCT MANUFACTURING, PACKAGING, AND THE CURRENT DILEMMA

According to modern microeconomic theory, the quantity of MSW produced should reflect consumers' individual determinations that discarding the remains of each product is more beneficial than...
retaining them. But because the consumer price of a product is rarely linked to the costs of disposal, consumers have little reason to be concerned with how much MSW a given product produces. In particular, the environmental costs of packaging are routinely disregarded by manufacturers, primary consumers (those who incorporate the packaging into retail products), and ultimate purchasers of a packaged product.

A. The Traditional Cost of Product Manufacturing

The price of a product is traditionally based primarily on the direct costs to the producer of manufacturing the product. Such costs, however, do not include many costs generated during the manufacturing and disposal of the product that society in general must bear.

A brief discussion of a generalized life cycle will illustrate this accounting deficiency. The typical product life cycle begins with the extraction of the natural resources used as raw materials. The raw materials may be the basis of the final product (e.g., trees are a raw material for cardboard boxes), or they may be necessary corollaries to the production process (e.g., coal is a raw material needed to provide energy for producing the steel used in metal containers). Raw materials must be refined into a state that can later be formed into the product (e.g., wood pulp is transformed into sheet cardboard). This second stage may be referred to as material manufacturing. Next, the primary materials are formed into the finished product (e.g., packing boxes are made from sheet cardboard). Fourth, the product is distributed to the final consumer. In the fifth stage, consumer use of the product diminishes its value. Eventually, the product has so little value to the consumer that it is cheaper to discard it than to retain it. The sixth and final stage of the life cycle is waste management.

packaging into a single consumer product. Thus, a tee-shirt manufacturer might be a consumer of both plastic to wrap the tee-shirts and cardboard boxes to ship them to a retailer. The retailer disposes of the cardboard boxes and sells the tee-shirts to a final consumer, who, in turn, disposes of the plastic wrap before wearing the tee-shirt.


13. Id. at 18.

14. Id.

15. Id. This step usually includes various sales and transportation processes.

16. See id. The fifth stage varies widely depending on the product. For example, a refrigerator could be in the consumption stage for 20 years, all the while having various environmental impacts. A postage stamp might be consumed a few days after purchase and enter the waste management stage soon thereafter.

17. Id.
In this stage, the product is discarded and either disposed of (e.g., through incineration or landfiling) or recycled.\textsuperscript{18}

In a market economy, the cost of producing an item determines its price. Each of the first four stages of a product's life cycle can exact costs of land, labor, capital, and energy consumption. For example, the price paid by those who purchase bauxite, the primary raw material for aluminum, reflects the cost of extracting the bauxite.\textsuperscript{19} Similarly, the price of the refined aluminum reflects not only the cost of extracting the bauxite, but also the costs of the land, labor, capital, and energy needed to refine the bauxite into aluminum. Each of the stages of production may result in air emissions, water effluents, industrial waste pollution, resource depletion, and other environmental impacts. In a regulated world, these impacts result in costs—environmental control costs—added to the stage of the life cycle where the controls are imposed.\textsuperscript{20}

\section*{B. Hidden Costs}

Even when a revised economic valuation accounts for both the costs of environmental control for each stage of production and the cost of producing a product in the unregulated market, that valuation still misses certain hidden costs to society. In the neoclassical economic world, the price of the product would control the quantity of the product demanded and thus produced, while curtailing the socially negative aspects of the product through market competition. However, this price, and the estimate of economic efficiency it reflects, does not include many costs to the environment, including the costs of the waste management stage of the product's life cycle.\textsuperscript{21} The cost of waste management is an example of an externality of product manufacture and consumption. Society pays the price for externalities—indirectly through health costs and lost resource endowments, or directly through taxes that support, for example, garbage collection—but the cost of waste management is not directly associated with the production of the product and thus is not reflected in the price of the product.

\begin{footnotes}
\item[18] If the product is incinerated or landfilled, then its cost to society based on its use of natural resources ends with this process and is easily calculated. If the product is recycled, its cost to society is reduced, at least to the extent that the next product created from the material does not have costs associated with the extraction of raw materials. See Schall Paper No. 1, supra note 5, at 67; see also discussion infra part I.B.2.
\item[19] For a brief description of the aluminum industry and processing methods, see OTA Report, supra note 1, at 153-56.
\item[20] Life cycle assessment (LCA) is a relatively new methodology for evaluating the economic externalities associated with each stage of a product's entire life cycle. See infra part II.D.
\item[21] For a brief, accessible discussion of the effect of externalities on the efficiency of market mechanisms, see Baumol & Blinder, supra note 11, at 634-39.
\end{footnotes}
1. *System Externalities in Overview*

The consumer price fails to internalize at least three categories of costs associated with a product life cycle. Because the consumer does not recognize these costs in the purchase price, demand for a product consistently fails to promote informed individual decisionmaking that considers the environmental consequences of the consumer's choice.22

The first of these externalities occurs because environmental regulation does not mitigate every instance of environmental degradation.23 While political reality dictates that certain levels of environmental degradation be accepted, the degradation that occurs within these constraints is by no means costless. Pollution, even when below the threshold of control regulations, degrades the quality of life of residents of the polluted area. The *environmental externalities of a product's life cycle* include human health costs,24 ecological impact costs,25 natural resource depletion costs,26 and social welfare costs27—none of which is calculated into the net price of the product to the consumer.

22. See id.

23. We do not suggest that absolute environmental safety and protection should be the goal of environmental regulation. For many reasons, such controls would be economically and politically infeasible. Although the first 90% of pollution may be easy to clean up, the incremental cost of cleaning the remaining 10% increases drastically, and it is unlikely that society would be willing to foot that bill. See A. Myrick Freeman III, *Economics, Incentives, and Environmental Regulation, in Environmental Policy in the 1990s* 189, 192 (2d ed. 1994). Nevertheless, in a 1990 public opinion poll, approximately 70% of the respondents agreed that "protecting the environment is so important that requirements and standards cannot be too high, and continuing environmental improvements must be made regardless of cost." Christopher J. Bosso, *After the Movement: Environmental Activism in the 1990s, in Environmental Policy in the 1990s*, supra, at 31, 33 (citing Riley E. Dunlap, *Trends in Public Opinion Toward Environmental Issues: 1965-1990, 4 Soc'y & Nat. Resources* 285, 312 (1991)).


25. Although various regulatory schemes might attempt to remediate the ecological impact of certain production activities, most such schemes fail to ensure that the environment remains unsathed.

26. For example, many manufacturing processes rely on the use of fossil fuels. While a product's price may reflect the market value of petroleum used in processing, it does not necessarily reflect the cost of depleting that nonrenewable natural resource.

27. Most difficult to capture within a full-cost model, social welfare costs are indirect costs that arise from the mere existence of a facility. For example, society incurs costs beyond those reflected in property values when it locates manufacturing plants predominantly in low income areas. These costs include the reaction that residents of such a neighborhood have when confronted with a message that their neighborhood is less valuable to society, and, to some extent, the costs to society of vandalism, lack of structural maintenance, and lack of safety. See, e.g., Paul Mohai & Bunyan Bryant, *Environmental Injustice: Weighing Race and Class as Factors in the Distribution of Environmental Hazards, 63 U. Colo. L. Rev.* 921, 927-31 (1992) (discussing affected residents' views on inequities in the siting of hazardous waste facilities).
A second category of external cost associated with a product's life cycle is the set of economic externalities of the waste management system. Generally, products are disposed of through one of two methods. The waste can be taken out of the life cycle permanently by incineration or landfilling, or it can be recycled. Although consumers frequently pay for waste disposal—through municipal taxes or, for many businesses, through private contracts—this payment is usually separated from the consumer price. Thus, the combined cost of disposing of a product and its packaging is an externality of the product management process.

Third, there are environmental externalities of the waste management system. Like any other stage of a product's life cycle, the process of waste management itself has associated costs due to ecological impact, natural resource depletion, and effects on human health and welfare. While the magnitude of these costs will depend on the type of permanent disposal or recycling methods employed, the costs remain outside the market pricing mechanism for individual products.

2. Some Costs of Current Waste Management Alternatives in Detail

The tension between the desire for a fully protected environment and the unwillingness to finance that ideal ensures that most attempts to manage the environmental consequences of human activity will be incomplete. Municipal solid waste management is no exception. As discussed below, each of the three traditional waste management options—landfilling, incineration, and recycling—engenders environmental, health, and economic costs.

a. Landfilling

Landfilling is the most prevalent method of MSW disposal. Some, however, consider MSW landfilling a poor solution to local MSW disposal challenges, due to the perceived environmental and health effects of landfilling, the resistance from communities to the siting of new landfills, and the expense of constructing new landfills.

28. For an explanation of these costs, see supra notes 24-27.
30. Communities have opposed the siting of waste management facilities in general, as well as the siting of industrial plants and energy projects. For a discussion of the NIMBY (Not In My Back Yard) syndrome, the resultant gridlock, and the syndrome's impacts on environmental protection and policy, see Daniel A. Mazmanian & David Morell, The "NIMBY" Syndrome: Facility Siting and the Failure of Democratic Discourse, in Environmental Policy in the 1990s, supra note 23, at 233-49.
31. The increasing cost of constructing a new landfill that meets state and federal regulations has become prohibitive for many communities. H.R. Rep. No. 839, supra note 6, at 61.
Perhaps the most severe threat posed by landfills is that produced by polluted leachate, which is created as water percolates through a landfill, dissolving elements and compounds in the waste to form a contaminated solution.\textsuperscript{32} Leachate can seep into aquifers and flow into nearby surface waters, thus contaminating drinking water supplies\textsuperscript{33} and threatening wetland and marine ecosystems.\textsuperscript{34} A study by the United States Environmental Protection Agency (EPA) of 163 MSW landfills reported groundwater contamination at 146 sites and surface water contamination at 73 sites.\textsuperscript{35} The State of New York claims that the Fresh Kills Landfill, located on Staten Island, alone leaks two million gallons of leachate per day into surrounding groundwater.\textsuperscript{36} Landfills represent approximately 22% of the sites on the National Priorities List (NPL) of toxic waste sites most in need of cleanup.\textsuperscript{37}

Landfills also release methane gas, a byproduct of the decomposition of organic matter.\textsuperscript{38} Methane contributes to global warming;\textsuperscript{39} it

\begin{itemize}
  \item \textsuperscript{32} Philip R. O'Leary et al., \textit{Managing Solid Waste}, Sci. AM., Dec. 1988, at 36, 40-41.
  \item \textsuperscript{33} The Human Health Subcommittee of the EPA Relative Risk Reduction Strategies Committee identified contamination of drinking water supplies as pollution that carries a high risk to human health. \textit{Science Advisory Bd., U.S. Envtl. Protection Agency, SAB-EC-90-021, Reducing Risk: Setting Priorities and Strategies for Environmental Protection} 14 (1990) [hereinafter \textit{Reducing Risk}].
  \item \textsuperscript{34} Nearly one-third of the United States' surface water flow is supplied by groundwater. \textit{Groundwater Related Programs of the USGS & the EPA: Hearings Before the Subcomm. on Water & Power of the Senate Comm. on Energy & Natural Resources, 100th Cong., 1st Sess. 158 (1987) (statement of Erik D. Olson, Counsel, National Wildlife Federation).}
  \item Many landfills both on the National Priorities List (NPL) and currently operating were improperly designed and operated as judged by today's standards. \textit{Id.} Furthermore, because these sites began operating before the enactment of the Solid Waste Disposal Act, as amended by the Resource Conservation and Recovery Act, 42 U.S.C. §§ 6901-6992k (1988 & Supp. V 1993), many contain hazardous as well as nonhazardous solid waste.
  \item Newer MSW landfills are safer in both their construction and operation. If landfills are constructed with leachate collection systems, which usually consist of a nonpermeable liner and a network of pipes and pumps to collect and remove the leachate, the threat of groundwater contamination is significantly reduced. \textit{See} O'Leary et al., \textit{supra} note 32, at 41-42. However, more than 70% of United States landfills do not have adequate liners to prevent percolation of leachate into soil and groundwater, and more than 78% do not have leachate removal systems. \textit{Solid Waste Disposal Act Reauthorization: Hearings on H.R. 3865 Before the Subcomm. on Transp. & Hazardous Materials of the House Comm. on Energy & Commerce, 102d Cong., 2d Sess. 185 (1992) [hereinafter \textit{Hearings on H.R. 3865}] (statement of Rep. Molinari).}
  \item \textsuperscript{36} Melinda Beck, \textit{Buried Alive}, NEWSWEEK, Nov. 27, 1989, at 66, 67.
  \item \textsuperscript{37} OTA REPORT, \textit{supra} note 1, at 271. The NPL is a roster of hazardous waste sites, which are prioritized to receive financing for cleanup under the Superfund program. \textit{See} 42 U.S.C. § 9605(a)(8)(B) (1988).
  \item \textsuperscript{38} O'Leary et al., \textit{supra} note 32, at 42.
  \item \textsuperscript{39} Commentators Favor, Oppose Major Revisions to U.S. Action Plan for Global Climate Change, 23 Env't Rep. (BNA) No. 48, at 3054 (Mar. 26, 1993). EPA identified global warming as a relatively high risk environmental problem, particularly because the scale of
is considered to be twenty times more potent a greenhouse gas than carbon dioxide. In addition, methane is extremely volatile and presents a significant threat of explosion when not properly controlled. But fewer than 2% of U.S. landfills have methane gas controls.

Other factors have also contributed to dissatisfaction with landfilling. As concern about the environmental and health effects of landfills has increased, the cost of landfill disposal has risen dramatically. This is true not only in densely populated areas like the Northeast United States, but in other areas of the country as well. Since the late 1980's, the cost of solid waste management has been one of the most rapidly increasing items in municipal budgets. Moreover, the cost of constructing a new landfill that meets applicable state and federal regulations may be prohibitive for some smaller communities. Finally, although the MSW stream is largest in regions of high population, these areas are frequently the most difficult places in which to site waste disposal facilities because land is scarce and expensive.

b. Incineration

Because it substantially decreases the amount of MSW that must be landfilled, incineration has become an increasingly popular waste...
disposal method.\textsuperscript{49} Generally, incinerators also require much less land area than landfills. Like landfilling, however, incineration has attendant health and environmental risks, and incinerators consequently can be rather difficult to site.\textsuperscript{50}

While burning MSW reduces its volume significantly, the process transforms a portion of the solid mass into regulated gases and particulate matter. For example, incineration produces oxides of nitrogen, a major factor in the formation of ozone, the key ingredient of urban smog.\textsuperscript{51} Incinerators may also emit sulfur dioxide, which has been linked to the formation of acid rain.\textsuperscript{52} Another primary byproduct of the incineration process is ash, the solid residual that is not consumed.\textsuperscript{53} There is considerable debate over how best to dispose of this substance.\textsuperscript{54}

The incineration process also creates toxic substances, such as dioxins and furans;\textsuperscript{55} virtually all municipal incinerators tested have shown traces of these substances in their emissions.\textsuperscript{56} Incinerator stack emissions may also include dangerous heavy metals.\textsuperscript{57}

\textsuperscript{49} In 1980, 4\% of the waste stream was incinerated; by 1990, over 17\% was incinerated. \textit{Hearings on H.R. 3865, supra note 35, at 445 (statement of Robert H. Collins, Director of Solid Waste Programs, Clean Water Action); JAMES E. McCARTHY, CONGRESSIONAL RESEARCH Serv., No. IB92018, SOLID WASTE: RCRA REAUTHORIZATION ISSUES CRS-3 (1992) [hereinafter CRS ISSUE BRIEF (Dec. 1992)]. Some communities, especially when faced with the increasing costs of landfilling, have made major capital commitments to incineration. The largest facilities can require more than $500 million in capital. OTA REPORT, supra note 1, at 223.

\textsuperscript{50} CRS ISSUE BRIEF (Dec. 1992), supra note 49, at CRS-3.

\textsuperscript{51} OTA REPORT, supra note 1, at 230. The incinerator proposed for the Brooklyn Navy Yard in New York City is expected to emit almost 3000 tons of nitrogen oxides (primarily nitrogen dioxide) each year. \textit{See ERIC A. GOLDSTEIN & MARK A. IZEMAN, NATURAL RESOURCES DEFENSE COUNCIL, THE NEW YORK ENVIRONMENT BOOK 39 (1990). In contrast, the largest source of nitrogen oxides in the region, automobiles, contributes over 36,000 tons per year. Id. at 101.}

\textsuperscript{52} OTA REPORT, supra note 1, at 230, 234. The proposed Brooklyn Navy Yard incinerator is expected to emit sulfur dioxide at a level of 1189 tons per year. \textit{See, e.g., GOLDSTEIN & IZEMAN, supra note 51, at 39.}

\textsuperscript{53} See OTA REPORT, supra note 1, at 247.


\textsuperscript{55} OTA REPORT, supra note 1, at 226-29. The most lethal forms of dioxins and furans are capable of killing laboratory animals in concentrations as low as 50 parts per trillion. \textit{JAMES E. McCARTHY, CONGRESSIONAL RESEARCH Serv., No. IB91069, SOLID WASTE MANAGEMENT: RCRA REAUTHORIZATION ISSUES CRS-5 (1992) [hereinafter CRS ISSUE BRIEF (Jan. 1992)].}

\textsuperscript{56} CRS ISSUE BRIEF (Jan. 1992), supra note 55, at CRS-5.

\textsuperscript{57} OTA REPORT, supra note 1, at 230-31.
projects that the maximum cancer risk from exposure to incinerator emissions may be as high as 1 in 1000 to 1 in 10,000.  

Although incineration can be relatively safe when state-of-the-art technology is installed, many still consider incineration unsafe. While incineration is ranked as preferable to landfilling on the traditional waste hierarchy, its attendant and perceived problems guarantee opposition from the public, thus increasing its cost.

c. Recycling

Recycling, as the term is commonly used, refers to the process of recovering materials that otherwise would be disposed of and using those materials as a resource for the manufacture of new products. Using recovered materials instead of raw materials for production allows a manufacturer to substitute the costs of the recycling process for the costs of natural resource extraction and refinement. To the extent that the costs of recycling are less than those of extraction and refinement, recycling is more economically efficient.

However, creating the economic conditions that support recycling is a difficult undertaking for many communities. This is so primarily for two reasons. First, a recycling program requires a potentially large initial expenditure of capital. Second, because markets for most re-

58. See MWC Study, supra note 48, at 88. These figures reflect, respectively, the upper limits for "existing MWC maximum individual risk" and "projected MWC maximum individual risk."

59. EPA estimates that over 99% of most pollutants can be removed from incinerator emissions through a combination of combustion optimization, scrubbers, flue gas cooling, particulate collection, and nitrogen oxides controls. See id. at 72-76.

60. Although all new major incineration projects are designed to meet air pollution standards, concerns about the presence of metals and organic chemicals in emissions and ash have evoked strong opposition to incineration. See S. Rep. No. 301, 102d Cong., 2d Sess. 25 (1992). Also, the same NIMBY problems that vex the landfill siting process make incinerator siting difficult. For a discussion of siting problems for landfills, see supra part I.B.2.a.

61. See supra note 5.


63. Incinerators coupled with energy recovery processes (now often called waste-to-energy (WTE) plants or resource recovery plants) might be considered a type of recycling. However, as the term "recycle" is commonly used, the end product bears some relationship to the product recycled, whether in purpose or in commonality of basic structure. WTE plants convert all organic matter into a single commodity—heat. This process is not generally considered a recycling technology and will not be so considered here. See OTA REPORT, supra note 1, at 219.

64. See Schall Paper No. 1, supra note 5, at 64-65.

65. The actual costs of a recycling facility will vary, depending on the technologies used. In New York, the Staten Island landfill will be closed within the next decade, and officials have estimated that construction of recycling facilities to handle the trash from
covered materials do not yet exist, recycling often remains an economic burden. Thus, a community's commitment to recycling is often determined by the cost of MSW final disposal that will be saved by shrinking the MSW stream, the cost of operating the recycling program, and the amount of income that the recovered materials can produce.

Recycling also presents environmental and health costs. Creating a stream of recovered material may itself harm the environment. To keep recyclable material separate from nonrecyclable material after the consumer has separated them, the city must collect the two waste streams in different trucks. On the other hand, if the MSW is not separated by the final consumer before collection, then the community will need facilities, technology, and personnel for separating the MSW at a transfer station before shipping the separate waste streams to disposal (for nonrecoverable MSW) or to refineries (for recoverable MSW). In either case, MSW-handling vehicles will spend more time on the roads, resulting in more air pollution, road wear, and noise.

The actual processes of recycling may also have environmental costs. Different manufacturing processes rely on different technologies—with differing effects on the environment—to create usable recovered material. The environmental and economic effects of recycling, which depend on these varying processes, the local demand for raw or refined commodities, and the type of fuel consumed to produce the local source of energy, may be more or less than those of virgin resource refinement.

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See S. REP. No. 301, supra note 60, at 36. In New York City, 1991 costs for collecting and processing recyclables were nearly $300 per ton, compared to $130 per ton charged for regular garbage. Id. At that time, the city was paying contractors between $20 and $50 per ton to remove collected recyclable paper. See id.

Source separation requires a larger number of trucks than does traditional curbside trash collection, while post-collection separation requires first transporting the MSW to a sorting plant before the recyclable and nonrecyclable fractions finally reach processing facilities.

See OTA REPORT, supra note 1, at 193-94.

Often, the environmental costs associated with recycling technology are a function of the amount of energy required by the recycling process. The environmental cost of electricity production—including the mining and refining of the fuel—is often quite high, despite the fact that energy utilities are highly regulated. See generally WALTER A. ROSENBAUM, **ENVIRONMENTAL POLITICS AND POLICY** 241-67 (2d ed. 1991) (discussing environmental effects of energy generation via both nuclear power and fossil fuels).

See OTA REPORT, supra note 1, at 190-93 (discussing pollution levels from both primary and secondary manufacturing processes).
For example, aluminum recycling uses significantly less energy than bauxite refinement to produce the same amount of aluminum.\textsuperscript{71} This one factor makes aluminum recycling both environmentally and economically profitable, especially where electricity is expensive.\textsuperscript{72} Plastics recycling, on the other hand, is less advantageous. Even though the primary pollutants associated with plastics production are emitted during the initial production stage (which does not occur if plastics are recycled), plastics recycling entails its own environmental costs.\textsuperscript{73} Furthermore, the end product of the plastics recycling process is often of lower quality than virgin plastic.\textsuperscript{74}

\textbf{C. The Particular Predicament of Packaging}

Modern consumer society would be inconceivable without packaging. Packaging, which is subject to the same life cycle analysis as any other product,\textsuperscript{75} allows many types of commodities to travel long distances without losing value.\textsuperscript{76} The ability to transport highly pure substances, such as medicines, is similarly a result of modern packaging technology.\textsuperscript{77} Finally, the ability to consume discrete packaged quantities has permitted the expansion of the range of products available.\textsuperscript{78} Supermarkets have become the reflection of a diverse and democratic community in part because of modern packaging.

The benefits of packaging, however, are offset by the environmental consequences of discarded products. Packaging constitutes a significant portion of the MSW stream.\textsuperscript{79} The large and growing reliance on packaging results in increased environmental impacts and increased siting difficulty. Thus, society must find a balance between the costs and benefits of packaging. This balance is difficult to strike because packaging serves another purpose in modern society: advertisement. Packaging tends toward large, colorful, and recognizable

\textsuperscript{71} Id. at 154. Turning used aluminum cans into new ones takes 95\% less energy than producing new metal from raw bauxite. CRS ISSUE BRIEF (Jan. 1992), supra note 55, at CRS-7. One ton of recycled aluminum saves 4 tons of bauxite. Id.

\textsuperscript{72} The environmental cost of producing 1 ton of virgin aluminum has been estimated to be $1933. SCHALL PAPER NO. 1, supra note 5, at 60. By comparison, the environmental cost of producing 1 ton of recycled aluminum is $313. Id.

\textsuperscript{73} OTA REPORT, supra note 1, at 194. Most significantly, heating plastics can create volatile air emissions, and resultant residues can contaminate rinse waters. Id.

\textsuperscript{74} Many manufacturers are reluctant to use recycled plastics, which they perceive as having lower quality than virgin materials. Id. at 178. However, a study by the Center for Plastics Recycling Research indicates many manufacturers are unaware of technologies that have increased the quality of recycled plastics. Id.

\textsuperscript{75} See discussion supra note 10.

\textsuperscript{76} Packaging in the '90s, GARBAGE, Dec.-Jan. 1993, at 24, 26.

\textsuperscript{77} See Stana, supra note 29, at 16.

\textsuperscript{78} Id.

\textsuperscript{79} See discussion supra note 8.
designs that capture consumers' attention as they walk down the market aisle.  

Furthermore, consumer products are often encased in multiple layers of packaging to create an exaggerated impression of product purity. The emphasis on size and abundance of packaging has led many to complain that some products are over-packaged, that there are negligible or few benefits to consumers from large and abundant packaging, and that such packaging is simply a "hook" to increase sales.

Of course, packaging regulation is more complicated than such simplistic condemnations of packaging design. It is frequently difficult to determine when packaging is excessive as compared to its benefits. Reliance on such measures as package-to-contents ratio seems particularly misguided unless the units of measurement and appropriate qualifications are clearly stated. Moreover, much modern packaging is lighter and less energy-intensive to produce than its predecessors.

For example, aluminum cans weigh about 30% less today than they did twenty years ago.

Contrasting the costs of producing packaging from virgin materials with the costs of producing it from recovered materials is essential for determining the best strategy to manage packaging. The relative environmental impacts of recycling versus virgin material consumption can best be understood by keeping the entire life cycle of the packaging in mind. According to a recent study, the adverse environmental impacts of the initial production stages of packaging are more severe than the impacts of packaging disposal. In fact, the packaging production life cycle poses its greatest environmental threats primarily

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80. See Britt A. Bernheim, Can We Cure Our Throwaway Habits by Imposing the True Social Cost on Disposable Products?, 63 U. COLO. L. REV. 953, 956 (1992).
81. See Stana, supra note 29, at 16; cf. Packaging in the '90s, supra note 76, at 29 (discussing the consumer preference for large packages, which may frustrate efforts to market "concentrates" with lower package-to-content ratios).
82. See Bernheim, supra note 80, at 953-56; Packaging in the '90s, supra note 76, at 24.
83. One product with a high package-to-contents ratio is single-serving cereal boxes, which have much more extra packaging as compared with the larger multiserving boxes. See Bernheim, supra note 80, at 953 n.5. More recently, public criticism of CD longboxes has prompted manufacturers to adopt smaller packaging for CD's. See Michael Saunders, Swan Song Is Played for the CD Longboxes, BOSTON GLOBE, Apr. 1, 1993, Metro/Region section, at 1.
84. See OFFICE OF TECHNOLOGY ASSESSMENT, U.S. CONGRESS, OTA-E-541, GREEN PRODUCTS BY DESIGN: CHOICES FOR A CLEANER ENVIRONMENT 25-29 (1993). On the other hand, modern packaging has become more complex, and in some cases is therefore more difficult to recycle. Id.
85. Id. at 28.
86. According to a study by the Tellus Institute, the environmental costs of disposing of most packaging range from $1 to $5 per ton while the environmental costs of production range from $85 per ton for virgin glass to $5053 per ton for polyvinyl chloride (also known as PVC, a common plastic). SCHALL PAPER No. 1, supra note 5, at 32.
at two stages: the raw material extraction stage and the final product manufacturing stage.

Virgin resource extraction, a stage of the product life cycle omitted when recovered materials are used, is often extremely damaging to the environment. For example, the adverse environmental impacts of metals mining and petroleum extraction—the initial steps of aluminum, tin, steel, and plastic packaging manufacturing—are well documented. 87

A discussion of the environmental costs of producing packaging from virgin materials is fruitless unless those costs are compared to alternatives. Using recovered materials in the production process instead of virgin resources reduces the environmental impacts of packaging production by lowering the amount of energy needed in the process and by producing fewer harmful byproducts. 88 According to the Natural Resources Defense Council, recycling rather than relying on virgin resources saves energy in amounts ranging from 26% for certain grades of paper to 96% for aluminum. 89 That energy savings translates directly into reduced air pollution. 90

Although the environmental impacts of packaging production are concentrated in the early stages of the product life cycle, material collection for recycling has its own costs. As noted above, recycling involves technologies that pollute and consume energy. 91 Depending on the local costs of land, labor, capital, and energy, these impacts might

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Using virgin materials as the basis for packaging also poses significant environmental hazards during the manufacturing process. One study has shown that the impacts from virgin production exceed the impacts from secondary production, even after energy impacts were taken into account. SCHALL PAPER No. 1, supra note 5, at 32 (showing the reduced environmental impacts of production for several types of plastic, paper, glass, and metals). One particularly striking example of the high environmental costs of virgin packaging production is the case of aluminum, where recycling has tremendous advantages—both environmental and economic—over refining aluminum from raw bauxite. See supra notes 71-72 and accompanying text.

88. This is true for all packaging materials examined in the Tellus study (i.e., corrugated cardboard, box board, glass, steel containers, and aluminum). SCHALL PAPER No. 1, supra note 5, at 59-60.


91. See supra part I.B.2.c.
be greater or less than the environmental impacts of landfilling or incinerating the packaging.

Because waste-to-energy (WTE) incineration is a popular method of waste disposal, any discussion of energy savings attributable to the recycling of packaging must also take into account the lost energy value of the MSW stream caused by the reduction of recyclable material content. It appears that for all of the most common packaging materials, however, using packaging material as fuel for WTE facilities instead of as raw material for new products results in no net energy savings. For example, plastics produce large amounts of energy when burned and are therefore considered a good fuel for incineration. However, because plastics can be recycled through several cycles, the energy conserved from recycling exceeds that available through incineration. The same is true for wastepaper. Moreover, energy savings from recycling accrue each time material from a product is recovered, whereas incineration produces energy only once. The benefits of recycling, rather than incinerating, noncombustible metals and glass are even more obvious.

II TOOLS FOR MANAGING MUNICIPAL SOLID WASTE AND PACKAGING

The failure of product price to capture the externalities associated with product manufacturing suggests that markets currently are unable to manage the environmental costs of such manufacturing in a socially desirable manner. As long as this economic distortion per-

92. OTA Report, supra note 1, at 219. Plastic packaging companies have claimed that it is easier to incinerate plastic for energy than to recycle the material. Ferdinand Protzman, A Nation's Recycling Law Puts Businesses on the Spot, N.Y. Times, July 12, 1992, § 3, at 5. The issue has created debate between some experts who reason that burning scrap plastic is more energy efficient than recycling, and environmentalists who claim such savings do not exist. Paul Glastris, Environmental Fights in the Family, U.S. News & World Rep., Jan. 11, 1993, at 27, 27.

93. Edward J. Stana, president of the Council on Packaging in the Environment, has stated that plastics have about twice the heat energy as coal, and, in fact, burn more cleanly. Stana, supra note 29, at 19.


95. Id.

96. Id.

97. See supra part I.B.

98. Markets coordinating waste and materials management fail for many reasons. First, parties other than the consumers either realize unpaid benefits or incur unpaid costs of materials management. John Schall, Solid Waste, Resource Management and the Economics of Market Failure (forthcoming 1995) (Program on Solid Waste Policy, Yale University School of Forestry and Environmental Studies Working Paper No. 2) [hereinafter Schall Paper No. 2]. Markets might also fail because of the presence of natural monopolies. Id. In addition, competition may be less than optimal because the
sists, market forces will not produce efficient and environmentally protective MSW management.\textsuperscript{99} One common response to market failure caused by externalities is regulation—government intervention in the market to impose socially desirable outcomes on pricing systems that would otherwise not operate in the public interest.\textsuperscript{100} Many methods of regulation have been envisioned,\textsuperscript{101} some of which we discuss below in the context of packaging.\textsuperscript{102}

While the federal government has been involved in solid waste management policy since the enactment of the Solid Waste Disposal Act (SWDA), as amended by the Resource Conservation and Recovery Act (RCRA),\textsuperscript{103} the extent of that involvement has been limited primarily to regulating the disposal of hazardous wastes and to overseeing landfill design and operating standards.\textsuperscript{104} Nonhazardous MSW has traditionally been regulated at the state or local level.\textsuperscript{105}

startup costs of solid waste and materials management facilities and processes are very high. Id. According to a Department of Energy study, capital costs for WTE facilities vary between $100,000 and $120,000 per ton of daily throughput. This means that the initial cost of a 1000-ton-per-day facility would be between $100 and $120 million. Id. The New York City Department of Sanitation has estimated that the proposed Wheelabrator Brooklyn Navy Yard incinerator will cost approximately $133,000 per ton of daily throughput. Id. None of these figures include the capital costs of the required ash landfilling. MSW landfills, depending on the price of the land, may be equally expensive. Id. For a discussion of capital costs for various waste disposal options, see supra notes 31, 49, 65.

99. John Schall writes:

For every type of waste management option, the marketplace fails to insure that the right amount of capacity is developed and it fails to establish the socially optimal pricing structure among the waste management options. This failure . . . [occurs] simply because all waste management options have technical, economic and environmental characteristics that insure the market will fail to produce the optimal allocation of resources and the optimal mix of waste management options.

Schall Paper No. 2, supra note 98.

100. See Duncan MacRae, Jr. & James A. Wilde, Policy Analysis for Public Decisions 190 (1979). Market failure has traditionally been deemed an event—some economists suggest the sole event—justifying intervention in the market. Id. at 189-91.

101. "The government must first determine which and to what extent environmental market failures warrant policy intervention. Then it can decide which policy tool to employ in remedying such market failures." Daniel J. Dudek et al., Environmental Policy for Eastern Europe: Technology-Based Versus Market-Based Approaches, 17 Colum. J. Envtl. L. 1, 8 (1992).

102. See infra part II.A-C.


104. See generally 42 U.S.C. §§ 6941-6949a (1988). In general, collection and disposal are viewed as primarily functions of state, regional, and local governments. Id. § 6901(a)(4).

The federal government also has regulatory authority over incinerator air emissions under the Clean Air Act, id. §§ 7401-7671q (1988 & Supp. V 1993), and over incinerator ash under the Resource Conservation and Recovery Act (RCRA), id. §§ 6901-6992k. For a more detailed analysis of RCRA regulation of incinerator ash, see Household Waste Exclusion, supra note 54, at 84-94.

105. See Schall Paper No. 2, supra note 98.
Recently, however, a number of forces have compelled consideration of national regulation for MSW and packaging.

The federal government does attempt to influence general environmental behavior with respect to MSW management, notwithstanding the lack of direct statutory involvement. Beyond the regulation of landfills in RCRA’s Subtitle D, that statute also supports research and development in waste management, establishes guidelines for local solid waste management plans, and provides for citizen suits to aid in enforcement of its provisions. As reauthorization of RCRA approaches, the law’s deficiencies have drawn the attention of would-be reformers. In 1990 alone, Members of Congress introduced more than seventy-five bills dealing with solid waste management.

Several policy reasons support the argument that packaging, in particular, be regulated on the national level. Although communities across the country have recently enacted a variety of strategies to limit waste and to increase recycling, and many communities see packaging regulation as a partial solution to local solid waste disposal problems, true source reduction—an important method of reducing packaging waste—cannot be achieved solely through local efforts. Many, if not most, of the products that become a locality’s solid waste stream originate in another part of the country. If municipalities or even states begin to enact their own packaging regulations, manufacturers would be faced with an array of local requirements so dizzying as to make the national marketing of a product impossible.
Federal legislation is also a fail-safe way—and maybe the only way—to create viable markets for recycled materials. One of the biggest impediments to increased recycling is the lack of markets for recovered materials. This deficiency has so depressed the market prices for many secondary materials that collecting and sorting those materials has been unprofitable. As new collection programs have come on line, communities have found themselves competing for scarce markets. Oversupply of aluminum, paper, glass, and plastics has steadily driven down the market prices for these materials. In many instances, communities have been forced to dispose permanently of collected recovered material where no market could be found. Legislation eliminating government subsidies for natural resource extraction could narrow the disparity between the true cost and market price of virgin materials, thereby making recycled materials more competitive. Furthermore, creating packaging standards that would lead to economies of scale in the materials recovery industry would make recovered materials more competitive with virgin materials. In brief, federal initiatives would ensure the national markets necessary to sustain recycling.

As federal and state regulators have increasingly become willing to intervene to improve solid waste management, they have sought

solid waste in the municipality as a violation of the Commerce Clause, where the purpose of the law was to recoup the cost of the facility); see also City of Philadelphia v. New Jersey, 437 U.S. 617, 629 (1978) (striking down a New Jersey law prohibiting the importation of solid or liquid waste originating outside of the state).

114. The market for recovered material is depressed partly because virgin production costs are generally lower than recycled production costs. However, this is primarily due to the fact that virgin processes enjoy economies of scale, and not because recycled processes are inherently more costly. Alan Davis & Susan Kinsella, Recycled Paper: Exploding the Myths, GARBAGE, May-June 1990, at 48, 51-54. Paper recycling mills, for example, are quite small compared to their virgin paper counterparts. Id. Also, although interest in recycled paper is growing, consumer demand has not created the pressure needed to spur the massive capital expenditures required to bring recycled paper production to parity with virgin paper grades. Craig Jolley, Using Recycled Paper: We’re Not Out of the Woods Yet, COMM. WORLD, Sept. 1990, at 16, 18. Plastics remain the exception to the general rule that secondary materials can compete with virgin materials if processed on a comparable scale; producing plastic from crude oil remains far less expensive than using secondary materials. Protzman, supra note 92, at 5. However, some feel that the plastics industry has not invested enough in research and development of recycling technologies. See, e.g., id.


116. H.R. REP. No. 839, supra note 6, at 63.

117. Id.

118. Prices for many virgin materials may be artificially deflated by government tax benefits, Bernheim, supra note 80, at 961, and below-cost sales of natural resources from federal lands, OTA REPORT, supra note 1, at 200.

119. However, a leading study on solid waste management has suggested that the effects of virgin materials subsidies on the market for recycled materials is insignificant. OTA REPORT, supra note 1, at 200-02.
tools to promote environmentally benign behavior. The two most frequently used mechanisms are regulation, or command and control (CAC) tools, and market-based tools. In many serious options, both CAC and market elements coexist in one management strategy. Such strategies are often referred to as mixed systems.

A. Command and Control Tools

The term "command and control," when describing legislative policy tools, refers both to the standards by which the regulated behavior is judged and to the method of enforcing those standards. In a CAC regulatory regime, a government entity (usually a legislative or administrative agency) sets standards and enforces them. While some CAC tools are not economics-based, the CAC regulations proposed for MSW management generally have been. A few examples of such tools follow.

1. Weight Reduction Standards

For packaging, waste stream reduction often involves reducing the weight of packages (i.e., lightweighting) or eliminating packaging altogether. Lightweighting could be achieved through mean weight reduction standards monitored by a government agency. One of the major RCRA reauthorization bills introduced in Congress in 1992 included lightweighting as a compliance option.

Some benefits of lightweighting are clear. Society in general may benefit from the reduction in quantity of MSW to be managed. For the packager, lighter packages usually reduce packaging and shipping costs. This simple equation could provide important incentives to packagers. But the pressures of advertising often make packages heavier and bulkier than would be necessary to protect products from spillage or damage or to prevent theft. In fact, a package's prominence on the retailer's shelf may be the governing factor in its design. Thus, an important obstacle to enhanced lightweighting is the

120. See infra part II.A-B.
121. See discussion infra part II.C.
122. See Dudek et al., supra note 101, at 2-3.
123. Id. at 3.
124. For example, national ambient air quality standards (NAAQS's) promulgated pursuant to the Clean Air Act, 42 U.S.C. §§ 7401-7671q (1988 & Supp. V 1993), are mandatory regardless of cost. Id. § 7409 (Supp. V 1993).
125. H.R. 3865, 102d Cong., 2d Sess. § 401(a) (1992). For example, a packager could comply with the requirements of House Bill 3865 by reducing the weight of its packaging by 15% per unit. Id.
126. In fact, lightweighting was used in the 1970's to reduce transportation costs during the oil embargo. Packaging in the '90s, supra note 76, at 29.
127. See supra note 80 and accompanying text.
cost of redesigning products or packaging to lighten the product while retaining its attractiveness to the final consumer.

2. Recycling, Content Standards, and Purchasing Regulations

Generally, recycling involves either separating recoverable material from collected MSW at a centralized facility or collecting the two MSW components—recoverable materials and nonrecoverable materials—after they have already been separated by the final consumer. Although many communities have established recycling programs of one type or another, the federal government has never mandated the institutionalization of local recycling programs.

A prerequisite to the success of any recycling program, regardless of the level on which it is instituted, is the availability of markets for the recovered materials. One straightforward way to create markets for recycled materials would be to mandate the use of those materials in finished products. Content standards, as such regulations are called, are a common feature of the RCRA reauthorization bills. Such standards are usually expressed as a percentage of the total weight of each item that must consist of recovered materials.

128. Both systems are typically supported, like other aspects of MSW management, by local taxes. See Schall Paper No. 2, supra note 98. However, while startup costs for both systems may be large—either for construction of a separation facility and training of personnel to operate the facility, or for curbside collection, new collection practices to keep waste flows discrete, and community education—recovered materials should provide a new flow of income that will offset costs.

129. For examples of types of recycling programs that are being tried in the United States, see Achterman, supra note 111, at 14-15. In 1993, states passed or amended 110 recycling statutes. No Mandates on Recycled Content Included in State Laws Enacted or Amended in 1993, 24 Env't Rep. (BNA) No. 36, at 1601 (Jan. 7, 1993) [hereinafter No Mandates on Recycled Content].

130. RCRA Subtitle D provides broad objectives and guidelines for the implementation of state and local solid waste management plans. It does not create any enforceable standards that would ensure that recycling is part of any such program. See 42 U.S.C. §§ 6941-6949a (1988).

131. Some communities have been forced to sell their recycled materials in distant markets, so that transportation costs exceeded revenues from the sale of recycled materials. See H.R. Rep. No. 839, supra note 6, at 63.

132. However, of the 110 state laws enacted or amended in 1993 supporting recycling, not 1 included new mandates on the recycled content of packaging. No Mandates on Recycled Content, supra note 129, at 1601.

133. See, e.g., S. 976, 102d Cong., 2d Sess. § 301 (1992); H.R. 3865, supra note 125, § 401. An example of a content standard would be: if the content standard of newsprint is deemed to be 75%, then each seller of the newsprint product (i.e., the newsprint producer and the newspaper publishing company that sells the newspaper to each customer) must be able to certify that the newsprint contains 75% recycled content. Otherwise, sanctions may
Content standards have been criticized as inefficient because they impose a uniform requirement upon companies with disparate technological capabilities.\textsuperscript{134} Also, some view content standards as being blind to the realities of supply.\textsuperscript{135} To address these shortcomings, manufacturers could be given a choice of several methods of compliance. For example, in addition to or in lieu of using secondary materials, manufacturers could reuse their products, arrange with another company to have their products recycled, or reduce the weight of their products.\textsuperscript{136}

Another potentially potent tool for creating large, stable markets for recovered materials is government purchasing. Purchasing regulations could require government agencies to purchase products with a minimum recycled content, which would provide an enormous market with the stroke of a pen. Over forty states now have recycled material procurement laws,\textsuperscript{137} and the federal government has had one since October 20, 1993.\textsuperscript{138} On that date, President Clinton signed an Executive order requiring that all printing and writing paper purchased by the federal government must contain 20% recovered material by the end of 1994 and 30% by the end of 1998.\textsuperscript{139} Although some industry representatives claimed that the mandated percentages are too high,\textsuperscript{140} few argued that the procurement regulations would not stimulate demand for recovered paper.\textsuperscript{141}


\textsuperscript{136} For examples of how such suggestions have been incorporated into bills proposed in the United States Congress, see discussion infra part III.A.

\textsuperscript{137} Federal procurement alone represents over 7% of the Gross National Product. S. REP. No. 301, supra note 60, at 40. In 1990, the federal government purchased more than 2.2% of the United States paper industry's domestic production of printing and writing paper. \textit{Id.}


\textsuperscript{139} Exec. Order No. 12,873, 3 C.F.R. 659 (1993).


\textsuperscript{141} In fact, the primary trade group for the paper industry has expressed some concern that it will be unable to meet the increased demand for recycled paper. See \textit{id.}
B. Market-Based Tools

Market-based policies primarily rely on economic forces to regulate actors in the market and thus to enforce the appropriate levels of product use and pollution. Though market-based tools necessitate some government-imposed parameters for behavior, these policy devices depend primarily on consumer preferences to direct individuals to act in ways that are environmentally benign.

1. Virgin Material Taxes

Under a typical virgin materials tax system, manufacturers pay a per-ton tax on all the virgin packaging material (i.e., packaging composed primarily of raw, nonrecovered material) they use. To establish such a system, Congress could approve a schedule of taxes on all virgin packaging materials and could set the rates in proportion to the perceived environmental costs of the materials, relying on such factors as acute toxicity, volatility, energy cost, and potential to damage natural habitats. Because manufacturers would most likely pass the cost of packaging on to consumers, a company that packaged its products in a more environmentally responsible manner (i.e., by using less virgin material or by using virgin materials with lower overall energy costs) would enjoy a competitive advantage. If price differences between differently packaged products were significant, manufacturers might be forced to redesign their packages.

Although a virgin materials tax might be an efficient way to reduce the environmental impacts of packaging, instituting such a system would be difficult. Any new tax would probably be met with

142. Dudek et al., supra note 101, at 14; see also discussion infra part II.C (discussing mixed systems for managing packaging).

143. The theory behind these tools is that if the actual price of a product to the consumer more accurately reflected the true cost of the product to society, then a more appropriate supply and demand tension would provide a cleaner environment. See Dudek et al., supra note 101, at 8. Thus, most market-based management tools will end up suggesting the addition of costs to the value of the product in an effort to internalize current market externalities.

144. See OTA REPORT, supra note 1, at 20.

Of course, eliminating government subsidies of virgin materials might reduce the need for a packaging tax. For a discussion of federal subsidies for virgin materials and the effects on the recycling market, see id. at 197-201. However, even if all subsidies for virgin materials were eliminated, the externalities would continue to distort the price system. See supra part I.B.1.

145. It should be noted that other, much-discussed tax schemes might have the same effect, although more indirectly. For example, taxes on either the carbon or energy consumed in the production of a product would add to the cost of packaging, and presumably that cost would be passed on to the consumer. Similarly, life cycle analysis makes it possible for a government actor to add the costs of externalities to the price of the final product. For a discussion of life cycle assessment, see infra part II.D.
considerable hostility, despite the fact that the ultimate cost to many manufacturers of modifying their packaging practices might be lower under a tax system than under a command and control system. Another problem with a tax system is the formidability of structuring the system so that it would produce the desired effects. Tax rates must be carefully calibrated to provide the appropriate economic incentive. Setting virgin materials tax rates would require expertise in the relative costs of different industrial processes and in the technological feasibility of modifying packaging designs. If the tax was set too low, it might be cheaper for a company to continue its existing packaging practices than to modify them. Although a high tax might achieve the desired reduction in packaging waste, it might do so at excessive cost to industry. A regulatory scheme based on virgin materials taxes would need to have flexible rates that could be adjusted in response to shifting market dynamics and to changes in the environmental controls that also capture ecological externalities.

2. Fee Schemes

Many economics-based management tools operate by attempting to raise the prices of products to meet the actual cost of the products to society. Fee schemes do this by directly linking the quantity (by either weight or volume) of waste with the price of disposal. For example, some municipalities now charge residents a fee for every can or bag of garbage they set out on the curb.

Although a per-bag fee on solid waste might make households more waste conscious, it is doubtful if that alone will produce a significant change in packaging practices. While purchasing decisions might be more environmentally driven with such a fee than without one, other considerations, such as convenience and attractiveness of a product, may overwhelm waste-related concerns and cause consumers to favor products with abundant packaging. If this dynamic encour-

146. For example, George Bush's unsuccessful bid for reelection to the Presidency in 1992 has been blamed, in part, on his failure to keep his promise of "no new taxes." See, e.g., Michelle Quinn, Orange County's Taxing Future, S.F. CHRON., Dec. 14, 1994, at B1.

147. For a brief discussion of efficiency in taxation, see BAUMOL & BLINDER, supra note 11, at 727-28.

148. Seattle has initiated a volume-based rate program for solid waste disposal, charging citizens a fee for every can of trash they set out. Currently, 89% of households in Seattle put out one can of garbage or less each week. S. REP. No. 301, supra note 60, at 26.

149. Household waste fee schemes may not always be effective in reducing waste, even absent outside factors. For example, while most Seattle households generate one can of garbage or less each week, Seattle residents are also the creators of the "Seattle stomp," which effectively crams more waste into each trash can. Waste and the Environment, supra note 4, at 13. Beyond the great difficulty in enforcing per-bag, pay-to-throw schemes, such a policy could create an enormous incentive to dump illegally. Id.
ages packagers to maintain the status quo, the environmental impacts of packaging will remain undiminished.

Another, less direct way to impose the full social costs of wasteful packaging on consumers is to levy a fee on landflling and incineration. Such a tax would likely encourage municipalities to improve recycling and to find innovative ways to reduce solid waste. Municipalities would put pressure on consumers to reduce their waste output, and consumers might in turn change their buying patterns to favor less wasteful products. But municipalities would doubtless oppose any attempt by the federal government to levy a waste disposal tax. Moreover, even if disposal taxes could be implemented, they would only indirectly affect packaging practices. Manufacturers would have little incentive, outside of pressure from consumers and municipalities, to package their products more responsibly. Finally, because environmental concerns are only one of many factors driving purchasing decisions, a disposal tax might have only a marginal effect on packaging practices. Since industry would not be held directly accountable for the quantity and composition of packaging (and packaging waste) that it produces, essential changes in industry’s approach to packaging might not occur.

3. Deposit-Return Plans

Deposit-return systems operate on the principle that placing a significant refundable surcharge on a product will induce the consumer to act in an environmentally responsible fashion.\(^\text{150}\) Many deposit plans are working their way through state legislatures or have already been enacted in the form of bottle bills.\(^\text{151}\) In theory the scheme can be expanded to numerous other products.\(^\text{152}\) Depending on the scope of the statute, such laws directly affect consumer behavior by showing consumers just which products can be reused and thereby emphasizing the wastefulness of discarding materials.

However, deposit-refund laws are limited to certain materials and products. While such laws may effectively address beverage containers, car batteries, and even large durable goods like refrigerators and ovens, regulating general packaging and newspapers—both items that are currently a large component of the MSW stream\(^\text{153}\)—could be


\(^{152}\) See, e.g., Robert W. Hahn & Robert N. Stavins, Incentive-Based Environmental Regulation: A New Era from an Old Idea?, 18 Ecology L.Q. 1, 10 (1990); Dudek et al., supra note 101, at 39-40.

\(^{153}\) Packaging represents approximately 34% of the MSW stream. See supra note 8. Newspaper accounts for approximately one-third of the volume of discarded paper and
mattly harder. Furthermore, requiring stores to accept returned materials could pose serious logistical problems for retailers, particularly in urban areas where space constraints are most acute. On the other hand, if the producer of the product was responsible for collecting returns, small manufacturing businesses might not be able to survive the increased business costs due to materials recovery.

C. Mixed Systems

Building on command and control and market-based elements, and aimed partly at overcoming the difficulties with the strictly economic approach of the latter, mixed systems have the potential to provide the leverage of government enforcement while relying on the power of market incentives.

1. Informational Tools

Informational tools have the potential to help consumers make enlightened, environmentally benign purchasing decisions by providing them with information about the environmental consequences of a product’s production and use. By forcing manufacturers to fully inform consumers of the environmental effects of their packages, a well-designed labelling system might give more environmentally benign products a competitive advantage. Often referred to as “eco-labeling” or “green labelling,” the assertion of environmental sensitivity claims on product packages is now commonplace.

Eco-labelling regulation often standardizes the explanatory information allowed in the advertising of a product. Two examples are the movement to define the terms used to claim beneficial qualities (e.g., “recyclable,” “environmentally friendly,” “made out of recycled materials”), and the attempts to provide an “environmental seal of approval” for certain products.

Devising a labelling system that accurately informs the consumer of the environmental characteristics of a product could be a daunting task. Although it might be easy to indicate on a package what percentage of total MSW stream makes up more than 10% of the total MSW stream. Richard Madris, Recycled Newsprint Laws and Differential Taxation of the Press, 61 U. CHI. L. REV. 1069, 1086 (1994).

154. Such schemes would only be successful if participants could take advantage of economies of scale. See Peter Bohm, Deposit-Refund Systems 2 (1981).

155. For a discussion of how such logistical concerns have been addressed under the German Packaging Ordinance, see infra part III.B.1.

156. However, recent discussions about the regulation of packaging claims suggest that informational schemes will only provide evenhanded protection of the environment if well regulated. See, e.g., S. REP. NO. 301, supra note 60, at 49-50.

157. See id.

158. See id. at 49-51.

centage of the package is made of recovered materials, recycled content is only one indicator of a package's environmental friendliness. Other, perhaps more important, characteristics include the types of materials used in the package, the recyclability of the package, and the weight of the package. A labelling system that reflected the true environmental costs of packaging would have to take all of these factors into account. Conveying that information to consumers in a manner simple enough to process in the brief time most people allot to choosing a product, might be impossible. Also, considering the overwhelming number and variety of products on the market, assigning an accurate eco-value to each package would be an extremely costly undertaking.

The power of eco-labelling is not clear. Informational tools will have a significant effect on packaging practices only to the extent that consumer preferences are driven by environmental concerns. Because price, quality, and convenience often drive buying decisions, it is difficult to determine whether eco-labelling will have anything more than a marginal effect on packaging practices.

2. Tradeable Permit Schemes

Tradeable permits function to shift the cost of environmental improvement by rewarding the companies that can modify their practices most efficiently. Under a tradeable permit system, an allowable overall level of pollution is established and then allotted among firms in the form of credits or permits. Firms that keep pollution levels below their allotment may sell their surplus permits to other firms. Firms that exceed their allowed emissions would be fined. A permit scheme would benefit the environment by taking advantage of the disparity between various manufacturers' abilities to meet the standards; efficient packaging manufacturers would be encouraged to exceed the reduction goal and sell their surplus compliance, in the form of permits, to less efficient packaging reducers, for...

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160. See id. at 410-11.
161. See id. at 413.
162. See id. at 401.
163. See Hahn & Stavins, supra note 152, at 8-10.

For example, firms can be given the "right" to continue polluting at existing levels. A company producing 100 tons of a contaminant might be allotted 100 permits, each worth 1 ton of that contaminant. According to a preset schedule, the company might be required to retire, say, five permits each year, until the predetermined "optimal" pollution rate is achieved.

165. Id.
whom it would be cheaper to buy permits to meet the reduction goal than to actually reduce their packaging by the required amount.\textsuperscript{166}

A permit system might punish companies that had already streamlined their packages because it would be particularly difficult for such efficient companies to further reduce their packaging and take advantage of the scheme's incentives. One way to address this problem would be to charge firms for the initial permits. If firm $A$ and firm $B$ manufacture a similar product, but firm $B$ uses 30\% more packaging per product, firm $B$ would have to pay 30\% more for the right to package each product. This approach would both reward firm $A$ for its efficiency and give firm $B$ an incentive to reduce its packaging. Making companies pay for the initial right to package, however, would probably be met with enormous political resistance.

D. Life Cycle Assessment

Life cycle assessment (LCA), a method of analysis that informs the various tools discussed above, combines the strength of the traditional economic model with modern notions of full-cost accounting.\textsuperscript{167} LCA has been used to a limited extent in Europe for the past few decades;\textsuperscript{168} only recently has there been a concerted effort to refine its methodology in the United States. LCA is intended to be an objective process to evaluate the environmental burdens associated with a product, process, or activity by identifying and quantifying energy and material usage and environmental releases, to assess the impact of those energy and material uses and releases on the environment, and to evaluate and implement opportunities to effect environmental improvements.\textsuperscript{169}

Briefly, LCA tries to quantify all of the costs of product manufacture, including those unaccounted for in product price.\textsuperscript{170} The result is an abundance of information that can be translated into a dollar figure that theoretically corresponds to the cost of the environmental externalities of a product. Thus, LCA can be used to evaluate the environmental efficiency of manufacturing processes or to compare the

\textsuperscript{166} The predicted efficiencies will not be achieved if firms hoard permits, or otherwise attempt to control the market. For example, if firms are unsure of the value of permits, they may refuse to sell surplus credits in order to provide insurance against future changes in regulations. Robert W. Hahn & Gordon L. Hester, Where Did All the Markets Go? An Analysis of EPA's Emissions Trading Program, 6 YALE J. ON REG. 109, 129-33 (1989). For a survey of literature discussing general design concerns in marketable permit schemes, see sources listed in Marketable Permits, supra note 164.


\textsuperscript{168} Id.

\textsuperscript{169} Id. at 1.

\textsuperscript{170} Life-Cycle Assessment, supra note 12, at 1.
environmental "friendliness" of various products. Most broadly stated, LCA is a method for determining the "true" societal cost of a given product's consumption and presenting that information in a way that consumers can understand.

LCA is composed of three steps: inventory analysis, impact analysis, and improvement analysis. In the first stage, researchers compile a database of the energy and raw material requirements, air emissions, waterborne effluents, solid waste, and other environmental releases incurred throughout the life cycle of a product. During impact analysis, researchers assess the environmental impacts of this information with respect to human health and environmental integrity, and then may quantify those impacts in monetary terms. Finally, during improvement analysis, researchers systematically evaluate the opportunities to reduce the environmental burdens of the product life cycle.

Although the principle behind LCA—to identify the entire environmental burden of a product's use in an effort to inform parties as to the actual impacts of product usage—is easy to embrace, undertaking a credible LCA is quite difficult. Beyond simply the expense of tracking the life cycle of a product, the LCA assessors must make many decisions regarding methodology. For example, they must determine which environmental impacts associated with a product's manufacture are significant enough to include in the study. While the environmental impact of transporting bauxite to be refined into aluminum may be an obvious candidate for internalization, the environmental impacts of producing the truck that transports the bauxite may not be. Also, many of the environmental impacts identified in

171. See id. Of course, the idea that one product might be more benign than another assumes acceptance of an agreed-upon context for comparison. The lack of agreement is one of the more vexing aspects of LCA utilization. See id. (discussing the need for neutrality in LCA methodology and noting that results of life cycle assessments performed by different groups are often in conflict).

172. Id. at 2. The methodology for performing valid and replicable LCA's is constantly evolving. EPA's "Inventory Guidelines and Principles" is one example, but this evolution is also occurring in Europe. See EC Packaging Talks Focus on "Ecobilans," Prevention, Targets, Reuter European Community Report, Oct. 5, 1993, available in LEXIS, News Library, Wires File.

173. LIFE-CYCLE ASSESSMENT, supra note 12, at 7.
174. Id. at 7-8.
175. Id. at 8.
176. SETAC FRAMEWORK FOR LCA, supra note 167, at xviii.
177. LIFE-CYCLE ASSESSMENT, supra note 12, at 2.
178. LCA methodology suggests setting a clear rule regarding questions of this sort. Two potential rules are the so-called one step back rule (i.e., where environmental impacts of systems supporting the material use process are counted, but impacts of systems supporting support systems are not) or the one-percent rule (i.e., where only inputs that would comprise more than 1% of total environmental impact are counted). Id. at 44.
the inventory stage are not easily converted into monetary terms in the impact analysis stage.\textsuperscript{179}

The results of LCA are not always in line with what traditional environmentalists might expect.\textsuperscript{180} For example, some consultants who have performed LCA’s claim results that show polystyrene cups are more environmentally benign than paper cups.\textsuperscript{181} Others claim that cloth diapers are more damaging to the environment, over time, than are disposable ones.\textsuperscript{182} One lesson of the LCA experience is that each product seems to have an environmentally optimal rate at which its materials may be recovered. However, probably the most important lesson to be learned from these first brushes with LCA is that standardization is essential.

LCA can be an effective method to educate and create a more environmentally aware citizenry. If an LCA reveals all of the costs of a given manufacturing process, and those costs are added to the price of the final product, then the amount of MSW produced from consumption of the product should more accurately reflect informed consumer demand. This dynamic might then result in some absolute reduction in materials use.

\textbf{E. Limitations of the Economic Premise}

\textit{1. Tools of Environmental Management in Perspective}

Economists often advocate economics-based management tools as the dry-eyed, realist approach to environmental policy.\textsuperscript{183} However, while economic approaches may improve efficiency within a given market, much damage to the environment occurs because of factors that are outside of, or not sufficiently powerful to affect, the market within which the tools operate.

\textit{a. The Benefits of Economics-Based Tools}

The economic approach to MSW and packaging management does have some strong points. Although not all of the specific eco-

\textsuperscript{179} Furthermore, if assessors simplify the life cycle analysis by only examining a set of select characteristics, they may inadvertently ignore those impacts that are most difficult to quantify. \textit{See} Howett, \textit{supra} note 159, at 412.


\textsuperscript{181} \textit{See} \textit{Management Focus: Life-Cycle Analysis}, \textit{supra} note 180, at 77.

\textsuperscript{182} \textit{See} id.

\textsuperscript{183} \textit{See}, e.g., Dudek et al., \textit{supra} note 101, at 1 (advocating market-based approaches for future environmental policy in Eastern Europe); Hahn & Stavins, \textit{supra} note 152, at 13-14 (stating that incentive-based approaches make the environmental debate more understandable to the general public by focusing on goals rather than difficult technical questions).
nomic instruments mentioned above can accomplish all of the aims of packaging management advocates (and few will function well alone), such tools have the potential at least to promote two things: an efficient allocation of societal resources and education about the importance of packaging management.\textsuperscript{184}

The primary benefit of economics-based management tools is that they increase the efficiency of resource use. To the extent that marketplace dynamics can be recreated in the management of packaging, consumer choices should help to reduce wasted money, time, and energy. Because economics-based approaches rely on the demonstrated capability of markets to reach efficient solutions, they are often considered superior to command and control strategies.\textsuperscript{185}

Some analysts also consider CAC management inefficient because the bureaucracies charged with the enforcement of CAC regulations are notoriously wasteful.\textsuperscript{186}

However, although the least-cost notion is popular, the concept of efficiency within the environmental context is more nebulous than it might appear. While maximizing efficiency for a single process may be easy, packaging management consists of a number of processes.\textsuperscript{187} The efficiency analysis must therefore be systemic since enhancing the efficiency of one of the processes may make others more wasteful.\textsuperscript{188} Thus, although fee schemes may encourage the final consumer to consume less of a product (or, alternatively, to demand a lighter or

\textsuperscript{184} See Hahn & Stavins, supra note 152, at 12-14.

\textsuperscript{185} CAC regulation can create inefficiency in manufacturing by imposing the same requirements on all manufacturers, regardless of the comparative costs of complying with those requirements. \textit{Id.} at 6. Another criticism of CAC regulation is that it tends to be imposed against newly constructed facilities. Thus, older manufacturers get a break while startup companies, which often use more modern and innovative technology, bear the brunt of the regulatory burden. See Dudek et al., \textit{supra} note 101, at 13-14. Uniformity, in short, may not be efficient with respect to environmental policy; market-based approaches presumably would allow the flexibility needed to respond to environmental challenges in a least-cost manner. \textit{Id.} at 11-12.


\textsuperscript{187} See discussion \textit{supra} part I.C.

\textsuperscript{188} For example, some claim that municipal incineration's hunger for MSW diminishes support for waste reduction and recycling. See, e.g., John Holusha, \textit{Here's a Switch: Now They're Fighting Over Garbage}, N.Y. TIMES, Jan. 23, 1994, § 3, at 8. Still others assert that a focus on recycling diverts attention from MSW stream reduction. See Fishbein, \textit{supra} note 3, at 90 (discussing environmentalists' concerns over the effects of Germany's packaging ordinance).
smaller product), such consumer pressure is quite removed from the
effects of the natural resource extraction associated with that prod-
uct's production. Without more, the consumer is only part of the
 packaging management process to the extent that her or his buying
power is forcing a change of producer behavior; there is no conscious
decision being made with regard to supporting or promoting an envi-
ronmentally protected and less wasteful world.

In sum, economics-based, and especially market-based, manage-
ment strategies provide a socially desirable outcome—a more pro-
tected environment—by way of a well-recognized and accepted
mechanism. Beyond the precedent for allowing the government to
intervene in the market's operations for the perceived common good,
the use of market-based tools can easily be understood as regulation
with a democratic ring. Market-based tools, at some level, respond to
the desire of individuals in this country to make their own financial,
economic, and lifestyle choices.

Furthermore, economics-based packaging management policy,
because it must arise in the political arena, provides an opportunity
for citizens to engage in political debate, and thus educate and be-
come educated about important environmental issues. Indeed, as this
discussion has briefly suggested, there are tangible positive aspects of
forging policy in a way that is public and accessible to scrutiny. Policy
choices regarding packaging legislation, in particular, may affect not
only future consumer choices, but also may affect how those people
lead their lives. People produce, handle, and dispose of MSW daily;
there is no reason to believe that decisions that are made with respect
to MSW management will not become generalized lessons.

Therefore, a final way of thinking about the benefits of tools
based on economics is whether a given tool links an individual's com-
pulsion to act as a consumer to her desire to act in an environmentally
benign, or even beneficial, way; tools such as fee schemes provide no
opportunity for a consumer to make a conscious decision to support
or promote environmentally friendly activities on the part of the pro-
ducer. To the extent that a person understands her own behavior to
be part of a larger system of interaction, she might be better able to
relate such behavior to its environmental effects.

189. These preferences may have a significant impact on the market. In a 1989 study,
89% of people polled indicated concern about the environmental impact of products they
purchased. Barbara Boczar, Toward a Viable Environmental Regulatory Framework: From
Corporate Environmental Management to Regulatory Consensus, 6 DePaul Bus. L.J. 291,
303 (1994) (citing W. Edward Stead & Jean G. Stead, Management for a Small
Planet: Strategic Decisionmaking and the Environment 146 (1992)). For a related
discussion of the impact of environmental marketing claims, see supra part II.C.1.
Most of the policy tools described in this section fall far short of this goal. Economics-based approaches only indirectly affect individual consumer behavior; either they target only economic behavior (as fee schemes do), or they do not even address the final consumer's behavior, relying instead on regulating the producers or manufacturers who eventually transfer the cost of compliance to the consumer (as virgin materials taxes and content standards do). Whether the ultimate consumer ever understands, or even acknowledges, the change in policy in a way that alters her behavior is not a concern of such regulation.

b. The Limitations of Economics-Based Tools

Economics-based tools are premised on the existence of a market, but markets may never be able to reflect all types of valuation. The economic model best describes and predicts human behavior involving choices based on or affected by an expenditure of money. Yet, people do not always conceptualize their interaction with the environment as something that they pay for; even for packaging—where the end product is part of a commodity that can be bought—other factors, such as the linkage between the product's consumption and environmental degradation, may alter consumer demand for the product. For such tools to be environmentally protective, there must be full-cost accounting.

Economists have begun the process of determining which intangible ideas are susceptible to monetary quantification. They have devised a number of methods for valuing the natural resources that market forces miss. The most straightforward methods measure "use value." Use value theory presumes that every consumer can conceptualize the use of a natural resource and then place a price on the value of that use. Use value is usually computed by gathering information from surveys and constructing a demand curve from the data thus obtained. Examples of techniques to calculate use value include the travel cost method, the hedonic cost method, and various
ways to estimate contingent value.\textsuperscript{195} Although the failings of these methodologies have generated an extensive body of literature,\textsuperscript{196} we may assume for the sake of argument that economists could create tools to accurately gauge individual preferences and thus to put dollar amounts on all individual use of the natural resources that compose packaging.

However, such methodologies only begin to reach the externalities mentioned above.\textsuperscript{197} For instance, in theory there also exists a group of externalities broadly termed "nonuse values." These include the values that the consumer would expend for environmental amenities that she has no or little intention of ever using. Examples of nonuse values include existence value,\textsuperscript{198} option value,\textsuperscript{199} and bequest value.\textsuperscript{200} These values are intertemporal; their calculation depends on the consumer's opinion regarding future generations' potential desire for the resources. Such values are not only extremely difficult to quantify, but also may be subject to wide fluctuations.\textsuperscript{201} Furthermore, the very concept of nonuse value is somewhat outside the mainstream of traditional economic theory. The "invisible hand"\textsuperscript{202} works

\textsuperscript{195} Contingent valuation methodologies seek to gauge demand by surveying consumers to determine directly their stated valuation of goods. See \textsc{Robert C. Mitchell} \& \textsc{Richard T. Carson}, \textit{Using Surveys To Value Public Goods: The Contingent Valuation Method} 2 (1989). Contingent value methodologies may also be used to estimate "nonuse value." See \textsc{David Friedman}, \textit{The Revenge of the Redwoods? Reconsidering Property Rights and the Economic Allocation of Natural Resources}, 61 \textsc{U. Chi. L. Rev.} 493, 494 (1994).

\textsuperscript{196} Use value cannot properly account for resources that are not used. Furthermore, some feel that it is somewhat selfish, if not immoral, to juxtapose market values upon intangibles such as natural beauty and preservation of the environment. Cross, \textit{supra} note 192, at 283-84.

\textsuperscript{197} See \textit{supra} part I.B.1.

\textsuperscript{198} Existence value assesses the value that people place on preserving an environmental amenity, such as a forest, in its current state, regardless of whether they physically use it. See \textsc{Michael B. Saunders}, \textit{Valuation and International Regulation of Forest Ecosystems: Prospects for a Global Forest Agreement}, 66 \textsc{Wash. L. Rev.} 871, 875 (1991).

\textsuperscript{199} "Option value is the potential future benefit of preserving the natural resource as opposed to its present consumption." Bernheim, \textit{supra} note 80, at 960.

\textsuperscript{200} "Bequest value is an individual's willingness to pay for the satisfaction of endowing future generations with natural resources in an undisturbed state." \textsc{Duane Woodward} \& \textsc{Michael R. Hope}, \textit{Natural Resource Damage Litigation Under the Comprehensive Environmental Response, Compensation, and Liability Act}, 14 \textsc{Harv. Envtl. L. Rev.} 189, 200-01 (1990).

\textsuperscript{201} Often, contingent valuation methodologies are used to determine nonuse value. However, this dependency on survey data has been questioned because empirical studies have shown that people's expressed beliefs often do not correlate with actual behavior. Cross, \textit{supra} note 192, at 315. Also, survey responses may vary widely, depending on how the questions are phrased; typically, an acceptable selling price for an item is as much as twenty times greater than the value at which an individual is willing to purchase that same item. \textit{Id.} at 318. Nevertheless, studies have demonstrated that some results from contingent valuation surveys have been internally consistent and replicable. \textit{Id.} at 317.

\textsuperscript{202} Adam Smith posited that the market effectively promotes societal good through an "invisible hand" that directs individuals' economically self-interested actions to achieve
best when consumers are attempting to maximize their self-interested wealth; the generalized (i.e., nonindividualistic) nonuse value of natural resource preservation does not fit neatly into the standard model of utility maximization.

Given these concerns, it is far from clear that any heuristic could quantify nonuse values in a way that would accurately reflect the full value that people place on the natural resources that get turned into packaging. Furthermore, natural resource degradation is but one of the many externalities that make up the omitted costs of the packaging life cycle. Thus, while valuing the traditional cost of the waste management process in dollars might be relatively easy, valuing the social welfare costs of the environmental externalities of a product life cycle might be much more difficult.

c. The Policy Limitations of Traditional Valuation

Attempts to internalize the externalities of municipal solid waste management, and packaging specifically, have some obvious benefits. However, as discussed above, it is very difficult, if not impossible, to completely internalize the costs of packaging. The growing movement to internalize costs in search of full-cost accounting may thus never ensure protective environmental management.

Moreover, several philosophical arguments highlight the policy limits of economics-based tools. For example, there is strong support in the United States for absolute MSW stream reduction. The argument for MSW stream reduction is different from that for traditional MSW management methods (landfilling, incineration, and recycling) because it necessarily contests limitless natural resource consumption and, ultimately, economic expansion. The difference between absolute MSW stream reduction as a goal in itself and the economic

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203. See discussion supra part I.B-C.

204. LCA is only one example of this modern trend. Some economists also call for a new type of accounting that will include environmental impacts in macro-economic calculations. See, e.g., William K. Stevens, Economists Strive To Find Environment's Bottom Line, N.Y. Times, Sept. 8, 1992, at Cl; Peter Passell, Rebel Economists Add Ecological Cost to Price of Progress, N.Y. Times, Nov. 27, 1990, at Cl; Marlise Simons, Europeans Begin To Calculate the Price of Pollution, N.Y. Times, Dec. 9, 1990, at E3.


206. Of course, economic forces may support absolute MSW stream reduction. For example, the reduced availability of landfill space has diminished the economic efficiency and availability of land disposal in many municipalities. See Office of Solid Waste, U.S.
efficiency-seeking, traditional approach to solid waste management—including recycling—is one of valuation. The concept of value here is not used to describe the significance of a subject of inquiry in dollars, but broadly to recognize the subject as in some way benefiting and promoting the ideals of a given society. Promotion of absolute MSW stream reduction in the United States includes the idea that the burden of MSW management is compounded by a cultural adversity to wastefulness; the idea of producing waste is counter to the ethic of frugality that many people hold important and regard as a civic virtue.

Perhaps even more important to the MSW discourse, policies based solely on least-cost accounting methods fail to reflect how people conceptualize their choices within the context of modern society. Although cost internalization through economic measures may provide consumers a tool for deciding how to spend their money, it fails to put lifestyle choices in any context other than that defined by purchasing power; consumers are empowered only to the extent that they are consumers. Economic tools only reduce economic inefficiency, they do not necessarily reduce absolute material consumption or force consumers to evaluate the sustainability and other social implications of their purchasing preferences.

Env'tl. Protection Agency, EPA/530-SW-89-019, The Solid Waste Dilemma: An Agenda for Action 1 (1988); Lindsey Gruson, Mountains of Canadian Trash Are Hauled to Dumps in U.S., N.Y. Times, Nov. 27, 1991, at A1, B2. It is possible that increases in the cost of private landfilling may cause product manufacturing to become more expensive and thus lead to more efficient materials use. However, this article argues that a more direct connection between consumer behavior and environmental benefits is a necessary component of supportable environmental policy.

207. See generally Mitchell & Carson, supra note 195, at 58-69 (discussing various nonmonetary benefits that are considered in the contingent valuation methodology).

208. Labelling trash as "waste" implies the discomfort that many feel at the idea of discarding MSW. While it might seem counterintuitive that citizens of the United States, who produce large quantities of MSW per capita, might be disturbed by waste, it need not be. Although we produce vast quantities of MSW, we also concern ourselves to a surprisingly large extent with economic efficiency, environmental protection, reduction of bureaucracy, and economic growth. Indeed, a cottage industry of critics of United States consumption patterns seems to have arisen. See, e.g., Bill Dietrich, Different Dreams—Critics of America's Consumption Patterns Tour the Street of Dreams, and Use It as an Example of Why They Think People Should Ask Themselves How Much They Really Need, Seattle Times, Aug. 16, 1992, at G1; Alan Durning, How Much Is Enough?, Tech. Rev., May 1991, at 56, 57.

At the same time, it is maddeningly difficult to determine where exactly the inefficiency lies in MSW management. This is so because creating MSW is not often linked economically to managing it. This characteristic of MSW management—that it is the only part of the overall waste stream that is primarily paid for by taxpayer dollars—most clearly distinguishes MSW management from other types of solid waste management and underlies much of the confusion regarding potential MSW management strategies. How Garbage Could Meet Its Maker, supra note 2, at 108.
The philosopher David Orr has recently criticized policymaking based solely on the maximization of least-cost alternatives. He writes: "[S]ince there can be no good case for waste, least-cost approaches that promote efficiency are to a point beyond reproach. We should go as far as they take us. But they do not take us far enough."\(^{209}\) A system of environmental policymaking based primarily on maximizing self-interest potentially has drawbacks that together prevent these policies from being environmentally acceptable.\(^{210}\)

Because economic efficiency does not necessarily result in environmental protection, collectively defined standards of behavior must define the context for efficiency. Political dictates will always be needed to set boundaries for appropriate human interaction with the environment. Mixed systems\(^{211}\) tap the power of the market to produce economic efficiency without undermining the positive and necessary aspects of direct public involvement in determining an environmentally appropriate future.\(^{212}\)

Furthermore, defining "environmental amenities" as things that can be valued only in terms of monetary value reinforces a dichotomy between humans and their environment that is not only dubious, but also does a disservice to the quest for environmental protection. The culture of separateness, which has been promoted by a Lockean belief that natural resources are valueless until they are tamed by human interaction, precipitates environmental degradation.\(^{213}\) For example, this separateness may undermine attempts to protect the environment because the "environment"—being separate from humans—is poorly valued by human-constructed indicators.\(^{214}\)

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\(^{209}\) DAVID W. ORR, ECOLOGICAL LITERACY: EDUCATION AND THE TRANSITION TO A POSTMODERN WORLD 66 (1992). Orr's work suggests that "far enough" would be defined within a broad context of sustainability measured with reference to ecological integrity and the promotion of human dignity as well as to economic values. See id. at 3-66.

\(^{210}\) Orr recognizes at least four such drawbacks. These are: (1) the driving force of rational self-interest is a tautology: defining "self-interest" is the difficult part; (2) while rational decisionmakers might often make choices based on cost, they do not make the economist's mistake of believing least-cost to be synonymous with true cost (i.e., it is not possible to separate the economic and noneconomic factors that go into decisionmaking); (3) least-cost approaches succeed only as long as technological advances continue to lower the relative prices of options; and (4) the premise that self-interest leads to least-cost decisions and in turn to the collective good is deeply philosophical and suggests that we do not have to make determinations between right and wrong; to suggest that such a policy is "natural" is to obfuscate the existence of morality as compulsion. Id. at 66-67.

\(^{211}\) For a discussion of mixed systems, see supra part II.C.

\(^{212}\) Many economics-based incentive systems are mixed systems. For example, the Clean Air Act provides for trading of sulfur dioxide pollution permits within health-based, statutory restrictions. See 42 U.S.C. § 7651b (Supp. V 1993).

\(^{213}\) See, e.g., Orr, supra note 209, at 3-66; WENDELL BERRY, THEUNSETTLING OF AMERICA: CULTURE AND AGRICULTURE 3-26 (1977).

The culture of separateness has also estranged humans from their environment. Wendell Berry, describing the dichotomy of humans and the environment, writes:

Once we see our place, our part of the world, as surrounding us, we have already made a profound division between it and ourselves. . . . We have given up the understanding . . . [that] our culture and our place are images of each other and inseparable from each other, and so neither can be better than the other.215

Similarly, more than twenty years ago, representatives of many nations recognized that man "is both creature and molder of his environment," in that his environment gives him physical sustenance and affords him the opportunity for intellectual, moral, social, and spiritual growth.216 Such foresighted writing recognizes what the culture of separateness disregards: that humans are both beneficiaries and victims of our exploitation of natural resources. Human history is intricately linked to the natural world; humanity must conceive of this relationship in a way that supports effective and respectful management if it is to ensure its future.

Following Orr and Berry, if we understand that people rely partly on natural resources in seeking personal and community identity, then we can define the "environment" as the totality of human linkages to natural resources.217 This broader understanding of environment clarifies why efforts at quantifying all interactions with the environment in dollar terms are doomed to failure. The value that people see in the environmental integrity necessary to satisfy intertemporal concerns (e.g., option value), trans-species concerns (e.g., existence value), or ecosystemic concerns (e.g., noneconomic reasons for protecting natural landscapes) forms a part of the larger human relationship with the

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215. BERRY, supra note 213, at 22.
environment. Traditional least-cost approaches to environmental management fail to take into account the subtleties (and importance) of these broader environmental values by separating personal behavior from decisions based on the needs of society in general.\textsuperscript{218}

These and other noneconomic considerations indicate that increased economic efficiency alone will not meet the broad social challenge posed by solid waste management. Specifically, coherent and sustainable environmental management will occur only when consumers understand the environmentally adverse or beneficial value of their decisions. Therefore, while our proposal to expand the vision of environmental decisionmaking outlined in the next section does not neglect economics-based management tools, it does attempt to shift the focus of environmental policymaking from obsession with market forces to introspection regarding the social aspects of human needs and community responses to those needs.

2. Toward a More Environmentally Protective Valuation

The discussion above suggests that attempts to manage packaging in an environmentally protective manner must focus on reconnecting human behavior with the result of that behavior. To achieve this end, environmental protection should be understood as an aggregation of the many collective decisions that a society makes to better the lot of the individual and the group at the same time. Such decisions must provide both motivation for individual action and protection against the simplification that undermines a community’s identity.

We suggest that any supportable regulation of packaging must have at least the following three characteristics: (1) promote environmental protection as a value in itself, in addition to or consonant with the promotion of economic efficiency; (2) maintain or reestablish the connection between individual behavior and collective needs; and (3) be understood as making that connection (i.e., environmental regulation must be seen as the link between individual desires, collective needs, and environmental integrity that it is).

These criteria derive from the foregoing discussions of different approaches to packaging management and environmental protection. The first criterion is used to evaluate the degree to which a given proposal evades the means-ends confusion to which economic tools are so susceptible. Economic efficiency should never be an end in itself. Although advocates of using economics-based solutions to meet the challenge of instituting environmentally protective MSW management usually maintain that efficiency is only a path to environmental gain,

\textsuperscript{218} For a discussion of drawbacks of traditional least-cost economic models, see supra part II.E.1.
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we have shown above that the price system fails to account for important values.219

The second and third criteria stem from the premise that environmental regulation will not serve the nonquantifiable values that the market neglects unless regulation both connects individuals to the economic consequences of their choices and is seen to be doing so.220 The three criteria, in essence, call for government action that assumes environmental protection to be an end in itself and that actively invokes participation by individuals as consumers.

III
ANALYSIS OF APPROACHES TO PACKAGING MANAGEMENT

As outlined above, many methods could reduce the adverse environmental impacts of packaging. Reducing the weight and volume of a package may decrease the environmental impacts of production, reduce the environmental impacts at the disposal stage, and promote energy-efficient transport both in shipping the product and in disposing of the discarded packaging. A package can be made from recovered materials—or at least out of materials that are recyclable. Some packages can be made reusable. Furthermore, the toxicity of the materials used to make packaging can be reduced, so that the environmental impact when the discarded packaging is landfilled, incinerated, or recycled is minimized. Still, the central policy question remains: what combination of incentives and disincentives promotes the most desirable behavior?

In the past few years, both the United States and the European Union (EU) have witnessed broad efforts to regulate packaging. These attempts have included various sets of packaging management strategies aimed at creating a viable balance of carrots and sticks. Below, we discuss several suggested packaging management schemes proposed in the United States and Europe, and analyze these proposals from the perspective of the framework introduced above.

A. United States Initiatives

The two most significant pieces of packaging legislation recently considered by Congress are the Resource Conservation and Recovery Act Amendments of 1992 (Baucus Bill)221 and the National Waste Reduction, Recycling, and Management Act (House Bill 3865).222 Both proposals were introduced in 1992, but neither became law. Like

219. See discussion supra part II.E.1.b.
220. Id.
221. S. 976, supra note 133. Senator Max Baucus (D-Mont.) introduced the bill in the Senate.
222. H.R. 3865, supra note 125.
most efforts to respond to solid waste management problems in the United States, the bills focused primarily on recycling. That the bills took similar approaches suggests that this focus is likely to be central to any bill that might eventually become federal law in the United States.

1. Structure of Proposed Bills

The proposed bills used similar means to stimulate recycling: they made selected industry sectors responsible for recovering materials at given "recovery rates," and they encouraged or invented markets for the recovered materials.

Both the Baucus Bill and House Bill prescribed industry-wide recovery rates for at least five categories of packaging materials. For example, under the Baucus Bill, 40% of all glass containers were to be recovered in 1995. The bills differed significantly, however, in the scope of the materials covered. While the Baucus Bill defined "packaging" very broadly, House Bill limited packaging to bottles, cans, and jars made of aluminum, steel, plastic, or glass.

The bills employed similar mechanisms to make up the difference if the industrywide material recovery rates were not met. House Bill gave "packagers" (i.e., entities that either place a product in the

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223. A "recovery rate" may be defined as the amount of materials generated in or imported into the United States that are separated or diverted annually from municipal solid waste landfills, combustion units, and mixed municipal solid waste composting units and reused or recycled (including export for reuse or recycling), expressed as a percentage of the total amount of such material that would be destined for such landfills and units in a year if separation or diversion and reuse or recycling did not occur. *Id.* § 401.

224. *Id.; S. Rep. No. 301, supra note 60, at 29.* For example Baucus Bill set industry-wide recovery rates to be achieved by 1995 for five categories of packaging: paper or unbleached paperboard (40%), glass (40%), steel (40%), aluminum (66%), and rigid plastic containers (25%). The recovery rates for paper and plastics matched goals set by those industries. *S. Rep. No. 301, supra note 60, at 29.* Glass and steel were assigned the same rates because the two materials are used in many similar applications and are currently being recovered at similar rates. *Id.* at 37. The aluminum rate was based on recycling rates at the time the bill was drafted, adjusted for the addition of aluminum foil and other aluminum packaging. *Id.*

225. *S. Rep. No. 301, supra note 60, at 29.* The bill also gave EPA 1 year to develop a method to determine the aggregate recovery and utilization rate for each category of recovered material. *Id.*

226. Section 301 of the Baucus Bill defined "packaging" as: "[A] container or wrapping providing a means of marketing, protecting, or handling a product, including such materials as corrugated containers or other materials used to protect, handle, or transport covered products and packages . . . ." *S. 976, supra note 133, § 301.*

227. *H.R. 3865, supra note 125, § 401.* The House Energy and Commerce Committee cited difficulty in regulating the universe of "all packaging" as a reason for the latter bill's limited scope. *H.R. Rep. No. 839, supra note 6, at 84.* More probably, opposition from the paper and plastics industries, and not regulatory impossibility, rendered the bill toothless.
packaging for sale or, in the case of imported products, the distributors or wholesalers)\(^2\) several options for compliance with recovery rates.\(^2\) These were: (1) recovering, at the industrywide rate, material of the same composition as the packaging in question;\(^2\) (2) reducing the weight or volume of packaging; (3) utilizing refillable or reusable packages; (4) meeting target rates for recycled content;\(^2\) or (5) lightweighting. By institutionalizing this relatively clear policy, House Bill 3865 attempted to strike a balance between flexibility in compliance and simplicity of enforcement.

Under the Baucus Bill, failure to achieve the industrywide recovery rates required "responsible entities" (usually industry leaders)\(^2\) to meet company-wide recovered material utilization standards.\(^2\) To meet those standards, each company would have to choose from a list of options similar to those listed in House Bill 3865.\(^2\) Unlike House Bill 3865, though, the Baucus Bill permitted the responsible entities to mix and match their compliance strategies. For example, if EPA determined that an industry was not recovering the specified amount of paper packaging, the large manufacturers in the industry would individually become responsible for ensuring that paper packaging was reduced, reused, or recycled, to the extent mandated by the bill,

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228. Section 401 of House Bill 3865 defined "packager" as:
(A) in the case of a product placed in a package before entry into the United States, the distributor or wholesaler who causes the product to be brought into the United States;
(B) in the case of a product placed in a package in the United States before retail sale of the product, the person who places the product in the package; and
(C) in the case of a product placed in a package at the point of retail sale, the retail seller.

H.R. 3865, supra note 125, § 401.

229. Id. The bill calls its flexible compliance approach the Multiple Options Packaging Strategy.

230. A company could meet the recycling requirement of the first option by, either itself or through a designee, manufacturing "useable or marketable products" out of secondary materials at the industrywide recovery rate. Id.

231. The recycled content option required that a package contain at least 25% post-consumer material. Id.

232. The bill defined "responsible entity" as a company that: "(I) owns the brand name of a product . . . ; (II) distributes or arranges for the distribution of products . . . ; and (III) has total annual receipts in an amount greater than or equal to $50,000,000." S. 976, supra note 133, § 301.

233. Id.

234. Under § 301 of the Baucus Bill, a company could:
(i) utilize covered materials as recycled content in its own products or packaging;
(ii) ensure that covered materials are utilized in a product or packaging by another person;
(iii) reuse packaging for a purpose that is identical to its original purpose; or
(iv) reduce the amount (by weight) of covered materials used in packaging per unit of product sold from the amount used per unit sold in 1992.

Id.
through any combination of the methods specified in the bill.\textsuperscript{235} Although the company-wide compliance provision was designed to achieve maximum flexibility, EPA would have been hard-pressed to devise a scheme that allowed comparison between numerous manufacturing technologies for each alternative compliance method.\textsuperscript{236}

The bills outlined several methods to stimulate the markets for recovered materials. The Baucus Bill mandated increased federal procurement of recovered materials. It required all federal agencies to procure items made of the highest practicable percentage of recovered materials, whether or not EPA had issued procurement guidelines applicable to such items.\textsuperscript{237} The Baucus Bill also supported research and development of recycling technology.\textsuperscript{238} While neither bill mandated content standards that would have directly stimulated private markets for a range of recovered materials,\textsuperscript{239} House Bill 3865 mandated content standards for newspapers with circulations of 200,000 or more.\textsuperscript{240}

Both the Baucus Bill and House Bill 3865 established civil and criminal penalties for noncompliance. The Baucus Bill contained fines of up to $50 per ton for each ton below the specified recovery rate.\textsuperscript{241} While a violation continued, the responsible entity was obliged to place a special label on the products or packaging for which the entity was not in compliance.\textsuperscript{242} The label had to state that the responsible entity had not met federal recycling requirements for the material in question.\textsuperscript{243} House Bill 3865 established similar penalties and labelling requirements.\textsuperscript{244}

\textsuperscript{235} *Id.*

\textsuperscript{236} For example, it would be difficult to assess what percentage of recycled content use would be equivalent to a 10\% reduction in packaging weight. Furthermore, EPA would thereafter need to determine what combination of these two methods would satisfy the bill's requirements.

\textsuperscript{237} S. 976, *supra* note 133, § 304.

\textsuperscript{238} *Id.* §§ 308, 310.


\textsuperscript{240} H.R. 3865, *supra* note 125, § 406. One of the main features of an earlier bill, House Bill 3939, was a tradeable credit system under which a firm could buy the right to exceed the minimum content standards from a firm that overcomplied with the standards. H.R. 3939, *supra* note 239, § 201. This presumably would have shifted the cost of achieving industrywide minimum content goals to those who could do it most efficiently. The Baucus Bill recognized such a market mechanism as a potential alternative to the command and control approach, and expressly authorized EPA to establish a credit trading system to facilitate the transfer of credits to responsible entities from other users of the covered materials. S. 976, *supra* note 133, § 301.

\textsuperscript{241} S. 976, *supra* note 133, § 301.

\textsuperscript{242} *Id.*

\textsuperscript{243} *Id.*

\textsuperscript{244} H.R. 3865, *supra* note 125, § 401.
Finally, both bills promoted increased consumer information about recycling. The eco-labelling regulation proposed in both bills required the federal government to promulgate standards and criteria regulating the use of environmental marketing claims. House Bill 3865 also mandated that all plastic containers be imprinted with a code number identifying the principal plastic resin that composed a container, thus making recycling of such products easier.

2. Assessment of Proposed Bills

Our analytical framework requires that packaging management schemes: (1) promote environmental protection as a value in itself to be maximized; (2) maintain or reestablish the connection between individual behavior and collective needs; and (3) be understood by consumers as making that connection between the individual and collective aspects of environmental protection. While the Baucus Bill and House Bill 3865 both contained elements of a packaging management strategy that would have been an improvement on the current vacuum of such regulation, there are weaknesses in the approach reflected by the two bills.

Mandated recovery rates constituted the central element of the packaging legislation in both bills. This reliance on CAC enforcement instead of market-based mechanisms indicates that the bills were structured to achieve environmental protection irrespective of economic efficiency. But reliance on a static level of recycling has its own drawbacks. If recovery rates are not reviewed, then as technology and other circumstances change, the rates become less tied to a democratic mandate and more random, and thus may no longer reflect environmentally appropriate packaging management. While mandated recovery rates themselves may be an appropriate element of a well-considered packaging management strategy, they can only remain so if review is built into the system to ensure that those rates remain environmentally protective.

245. Id. § 403; S. 976, supra note 133, § 307.
246. H.R. 3865, supra note 125, § 404.
247. To the extent that the Baucus Bill's broader scope of coverage more precisely regulated packaging materials than House Bill 3865, the Baucus Bill is more protective of the environment.
248. The Baucus Bill's emphasis on federal procurement policy underscores that bill's commitment to environmental protection by directly supporting the market forces necessary for the CAC-stimulated recycling effort to succeed. This reliance on market forces does not detract from the environment-focused protectiveness of the bill.
249. The bills have the potential to bring a measure of economic efficiency to environmental protection. Allowing a choice of compliance methods encourages flexibility and creativity on the part of the regulated community. House Bill 3865, in effect, gives the regulated community a first chance before forcing each regulated entity to choose which compliance strategy will be enforced. The Baucus Bill—which, after an industry's initial
With respect to the second criterion, both proposed plans would have diffused responsibility for ensuring environmentally protective behavior. Individual consumers would have had almost no role to play since responsibility was vested primarily in the packaging industry. On the other hand, making producers the primary responsible parties for complying with the law would have had the positive effect of supporting the quest for creative ways to reuse materials. This would have been an improvement over the present situation, where final consumers are primarily responsible for making all choices regarding packaging management. Unfortunately, under the scheme promoted by the bills, the potential for this greater environmental benefit (presumably coupled with greater economic efficiency) would have been achieved in a way that dissociated final consumers from the process.

Indeed, the bills did little to inculcate an environmental sensibility in the general public. Final consumers would have had almost no role in the promulgation and enforcement of the standards; their behavior was only very indirectly connected with the environmental effects of the legislation. Yet the bills did present a few opportunities for citizens to have roles in packaging management. Setting and, potentially, periodically reviewing the recovery rates could involve a process of public participation and education. However, a citizen's most important role with respect to packaging management, as a consumer, would have connected her to environmental protection only to the extent both that the mandated eco-labelling reforms occurred and that she understood the plastic resin codes imprinted on the bottom of plastic containers. For the most part, the consumer's purchasing power under both bills was very weakly linked to environmental protection.

Both bills would have had the effect of stimulating recycling in the United States in a way that would greatly enhance efficiency within the packaging and MSW management industries. However, this laudable goal would have been achieved with little alteration of

failure to meet recovery rates, would have focused on a smaller group of parties—allows combining of available compliance methods to best serve the regulated party.

250. This criticism is both more and less applicable to the Baucus Bill's scheme because that bill would potentially have held individual companies responsible for the failure of their industry to meet recovery targets. The criticism is more pointed to the extent that adding another level of responsibility for environmentally protective behavior to the scheme—that is, making certain portions of an industry responsible when the industry as a whole fails to comply with the recovery rates—removes that responsibility from the final consumers by one step. However, the Baucus Bill directly connected the behavior of "responsible" companies to environmental behavior, so that many decisionmakers in these companies would be forced to learn environmentally beneficial behavior to comply with the regulations. The small number of people actually affected greatly limits the potential value of this latter claim.
consumer knowledge and behavior beyond that reflected in price-conscious purchasing decisions. Furthermore, by alienating consumers from the environmental impacts of their actions and by making recycling such a strong focus of packaging regulation, House Bill 3865 and the Baucus Bill marginalized absolute packaging and MSW reduction as a waste management option.

B. European Legislation

Although residents of the United States generate more garbage per person than do Europeans the acute shortage of landfill space in Europe has made MSW management a pressing issue there. This concern has led to a number of initiatives to lessen the burden of MSW disposal. Germany has the most comprehensive initiative, and the European Union has also recently begun to formulate an EU-wide packaging strategy.

1. The German Ordinance

The 3-year-old German packaging ordinance is the most innovative, and perhaps most onerous, national packaging law in effect. Although it has faced much criticism, some of which is discussed below, the ordinance provides the clearest set of lessons for would-be regulators of packaging in other countries, since it is the most comprehensive national-level packaging regulation in operation.

a. Structure and Enforcement of the Ordinance

Whereas the proposed United States packaging bills sought to reduce the amount of solid waste produced primarily by compelling producers to encourage recycling, the German law makes manufacturers and retailers responsible for collecting and recycling. Klaus Topfer, the German Environment Minister, has said: "It cannot be the task of states and communities to handle waste." This is a radical departure from traditional thinking about solid waste. The ordinance forces manufacturers and retailers to internalize the costs of waste management, which will give them an incentive to lower their collection costs by reducing the amount of packaging that they put on the market. The law indeed appears to be having such an effect. Detergents and

251. See supra note 3.
other products are being sold as concentrates to minimize container size, "steel cows" in grocery stores dispense milk into consumers' refillable bottles, and cardboard shipping boxes are rapidly being replaced by reusable shipping containers. Another salient example of the effect of the law is the disappearance of the toothpaste box from store shelves in Germany.

The ordinance's regulations set a different timetable and establish specific obligations for each of three types of packaging: transport packaging, secondary packaging, and sales packaging. Although in theory these can be easily distinguished, in practice it is frequently quite difficult, as the decision depends on the intended use of the packaging. For instance, shrink wrapping is cited as a typical example of transport packaging in the regulations, but it will be considered sales packaging if it serves to facilitate transport by the consumer or if it is necessary until the consumer uses the item. Under the law, manufacturers and retailers are obliged to accept the return of used transport packaging and to reuse or recycle it independently of the public waste disposal system. Retailers are given the choice of removing secondary packaging before they put products on the shelves or accepting the return of secondary packaging at or near the point of sale. Retailers must also accept the return of sales packaging at or near the point of sale.

Retailers and manufacturers share the obligation to reuse or recycle returned packaging. Companies are under no obligation to

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256. This includes drums, containers, crates, sacks, pallets, cardboard boxes, and other coverings that serve to protect goods from damage during transport from the manufacturer to the retailer. VerpackV, § I, art. 3, para. 1. The requirements for transport packaging entered into force on December 1, 1991. Id. § IV, art. 13.
257. Secondary packaging includes such items as blister packaging and cardboard boxes that are intended as additional packaging around the sales packaging and that serve primarily to allow goods to be sold on a self-service basis, to prevent theft, or to advertise the product. Id. § I, art. 3, para. 1. The requirements for secondary packaging entered into force on April 1, 1992. Id. § IV, art. 13.
258. "Sales packaging" is defined as any closed or open receptacle or covering over goods, such as cups, bags, blister packaging, cans, tins, drums, bottles, metal containers, cardboard and cartons, or any similar coverings that are used by the consumer to transport the goods or until such time as the goods are consumed. Id. § I, art. 3, para 1. The requirements for sales packaging entered into force on January 1, 1993. Id. § IV, art. 13.
reduce the weight or size of their packaging nor are they required to use a specified percentage of recycled materials in their packages. However, although the law does not set recovery or content rates, such standards are implied in the ordinance’s collection and sorting quotas. These implied recycling quotas are fairly high; by 1995, 72% of all glass, tin, and aluminum packaging and 64% of all paper, cardboard, and plastic packaging must be recycled. The remainder may be landfilled or incinerated.

In order to meet the demands of the law, hundreds of German manufacturers and retailers have enlisted in Duales System Deutschland (DSD), a joint venture that collects the packaging of its members from homes and from thousands of recycling bins throughout Germany. By the end of 1992, every German state had exempted retailers from the obligation to take back packaging on the condition that the DSD system function successfully. To participate in the system, packagers pay a fee that is calculated according to the number of units sold per year on the German market and the packaging volume. The packages of DSD participants are identified by a green dot. The DSD grants a green dot only if a recycling company has guaranteed that the specific type of packaging will be recycled. In order to ensure recycling, the DSD has entered into “unconditional acceptance and recycling guarantee” agreements with various recycling companies.

The green dot has sparked a great deal of controversy. Environmentalists are concerned that the green dot system encourages consumers to believe that all packages with the dot are environmentally benign. In fact, green dots are given to packages based on recoverability alone; DSD fees are not keyed to total environmental impact. So although two packages might have very different environmental

264. Id. § II, art. 6, para. 3 annex. For example, by July 1, 1995, 80% of all paper packaging must be collected, and 80% of all the material collected must be sorted. Because all of the material sorted must be recycled, the effective recycling rate is 64% (i.e., 0.8 x 0.8).
265. Id.
266. See infra text accompanying notes 279-80.
267. See Fishbein, supra note 3, at 89.
268. Packaging Ordinance Leads Most Firms To Reduce Packaging, Improve Recyclability, 16 Int'l Envtl. Rep. (BNA) No. 6, at 231 (Mar. 24, 1993) [hereinafter Packaging Ordinance Leads Most Firms To Reduce Packaging].
269. DUALES SYSTEM DEUTSCHLAND GMBH, DER GRÜNE PUNKT [THE GREEN DOT] 5 [hereinafter THE GREEN DOT].
270. According to officials at Duales System Deutschland (DSD), more than 70% of retail products in Germany now carry the green dot. Packaging Ordinance Leads Most Firms To Reduce Packaging, supra note 268, at 231.
271. THE GREEN DOT, supra note 269, at 4.
272. Id. at 6.
273. Protzman, supra note 92, at 5.
costs over their entire life cycles, the DSD fees are the same if the packages are of equal volume.274

Critics of the German system have also argued that it wastes more than it saves. The environmental costs of transporting packaging waste around Germany, sorting it, recycling it, warehousing it, and dumping it on other markets,275 it is argued, exceed the environmental costs associated with traditional packaging and waste disposal practices. To a certain extent, the German system has been a victim of its own success. In the first full year of operations, the DSD had expected the system to collect approximately 110,000 metric tons of packaging.276 But the response to the law was quite enthusiastic,277 and the DSD now expects to collect more than 440,000 tons per year, far more than Germany's recycling capacity of some 170,000 tons.278 The DSD has responded to the overload by exporting a large quantity of recovered material, by storing some collected material until more capacity comes on line, and even by landfilling some of the recovered material.279 The German government is now even considering incin-

274. The DSD replaced its simple volume-based licensing fees with materials-specific and weight-based charges in October 1993. Under the new regime, paper packaging is assessed the lowest licensing fee and plastics, the highest. The Green Dot, supra note 269, at 6. A second concern follows from the fact that non-German companies that sell their products in Germany are also subject to the packaging law. Companies, industry groups, and some European Union (EU) officials claim that the ordinance acts as a barrier to trade. Indeed, it is questionable whether Germany has the legal authority to extend the obligation to take back, reuse, and recycle to foreign manufacturers and retailers. In any case, there are signs that much of the alarm is unjustified, as many companies have adapted to the German market without much difficulty. Protzman, supra note 92, at 5.

275. The early reports on Germany's scramble to recycle are rife with tales of illegal dumping, glutted markets, and other unfortunate consequences of oversupply. One German recycling company was caught dumping plastics in France instead of recycling. Germans Agree To Stop Dumping Rubbish in France, Reuter European Business Report, Feb. 18, 1993, available in LEXIS, News Library, Wires File. Post-consumer German paper, sold at next to nothing, has flooded the market in France, threatening the French recycling industry and reducing by 30% the amount of waste collected in France since the beginning of 1993. French Paper Recycling Industry Launches Protests Against German Imports, 16 Int'l Envtl. Rep. (BNA) No. 7, at 252 (Apr. 16, 1993). "So much recyclable domestic waste is now collected in Germany that the government has been forced to send it free of charge all over the world—even as far as South America and the Philippines," Sonia Purnell, Germany's Waste-Size Problem, Daily Telegraph, Mar. 26, 1993, at City section, 23. In Indonesia, German plastic imports are so cheap that they threaten the livelihood of thousands of indigent waste collectors. German Waste Imports Seen Hurting Indonesian Poor, Reuter Library Report, Mar. 5, 1993, available in LEXIS, News Library, Wires File. In Great Britain, a common destination for German recyclables, some processors are actually being paid to take German waste, thus seriously threatening domestic recycling efforts. Purnell, supra, at 23.


277. Id.

278. Id.

eration for household waste disposal. Moreover, the flood of recovered materials spilling out of Germany has so undermined national recycling efforts in other countries that the German Environment Minister was prompted to call a packaging "summit" to discuss the problem. At this meeting, he promised to stop exporting plastic waste to other EU member states by the end of 1993.

Finally, the nascent DSD has been beset by financial difficulties. After its first full year of operation, the company posted debts of over US$500 million, which prompted the government to step in to broker a deal between industrial, retail, and waste treatment firms to stabilize the DSD's finances. The DSD blamed its debts on manufacturers, who it claims put the green dot on 90% of all consumer packaging but paid fees on only one-half of the total. The agreement addressed that problem by giving the DSD rights to control its licensees and impose punitive fines.

b. Assessment of the German Model

From the perspective of our suggested approach, in which connecting consumers to the waste disposal ramifications of their actions is a principal component of MSW management, the German model fares relatively well.

Like the United States proposals, the German ordinance's emphasis on achieving legislated levels of materials recovery (as reflected in the collection and sorting quotas) is an indication that environmental protection is not held secondary to economic efficiency as the focus of regulation. The German system's environmental ends are also evident in the broad market-based freedom that manufacturers and retailers have in choosing a method to achieve the goal of efficient recycling. The establishment of the DSD system and its approval by the legislature as a reasonable compliance method reflect the German government's desire to make the stringent requirements of the ordinance effective. Of course, the system suffers from a number of

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283. Id.
284. Id.
285. As in the United States, this is true only to the extent that the quotas accurately reflect environmental protectiveness. See supra notes 247-49 and accompanying text.
286. Advocating market-based tools and system flexibility does not necessarily contradict support for environmental priorities. As discussed above, flexibility and the inclusion of market-based tools may be a very effective way to achieve environmental objectives.
flaws. These include the asymmetry between the amount of material recovered and the market for that material. As we have repeatedly stressed, effective promotion of viable markets for recovered material may necessitate market intervention both to enforce recovery and to stimulate markets. The German regulators are learning this the hard way. Furthermore, international trade realities may reshape the German model. The trade ramifications of domestic environmental regulation are beginning to attract attention. Presumably, the attempts to craft an EU packaging directive will include harmonization of packaging regulations to reduce the effects on trade between member states.

While the broad German strategy of making companies and retailers directly responsible for recovering recoverable materials does not do any more to connect consumers to environmental protection than the United States proposals, implementation of the German policy is more consumer-oriented than either the Baucus Bill or House Bill 3865. Under the German ordinance, retailers and consumers are made conduits for the return of packaging material to manufacturers. To the extent that retailers are responsible for handling used packaging, they will undoubtedly pressure manufacturers to keep packaging to a minimum. Similarly, consumers who must either unpackage a product at a check-out line or at home (and thereafter place the packaging in curbside containers) are bound to be less enthusiastic about products with excessive packaging. The green dot program aids in translating consumer desires to support environmental protection into action through consumer purchasing decisions.

Perhaps the most attractive aspect of the German model, within our framework, is its potential to educate German citizens about the connection between their purchasing behavior and environmental

See, e.g., discussion supra part II.E.1. Indeed, one of the recognized successes of the German system is that it has led to research and development into more efficient packaging technology and to innovations in packaging design. Bette K. Fishbein, INFORM, EXECUTIVE SUMMARY OF GERMANY, GARBAGE, AND THE GREEN DOT: CHALLENGING THE THROWAWAY SOCIETY 3-4 (1994). See generally “De-wrapping” the Product, supra note 254, at 1 (discussing innovative methods for dispensing cosmetics, milk, and computer disks).

287. See supra notes 274-75 and accompanying text.

288. See discussion infra part III.B.2.

289. Retailers' primary consumption choices (i.e., determining which products to stock), while perhaps not as powerful a force in propelling changes to manufacturing process as the choices of final consumers, probably account for some pressure on manufacturers.

290. Although there is no “regulatory hammer” in the German system to compel consumers to actively recycle, the dissonance associated with environmental peer pressure and general civic lawfulness should translate on some level into reductions in demand for products with seemingly unnecessary packaging. There is no way to gauge how strong this consumer pressure is on manufacturers.
protection. The debate over and implementation of the program contributed to this effect. Operation of the program will keep ordinary Germans involved in the process in two synergistic ways: (1) retailers and final consumers must submit used packaging to the DSD collectors for recovery; and (2) the green dot program, if properly regulated, will affect buying decisions by heightening the environmental consciousness of consumers. While environmentalists are correct to question the message conveyed by the green dot, with effective education future purchases of marked products at least will be a strong vote for the recycling system.

In summary, problems with Germany's packaging management system are more a sign of the program's potential for success than of its impending failure. If the system was as successful at inducing creative and economical uses of recovered material as it is at encouraging recycling, the surplus of recovered resources would evaporate. The German system thus shows much promise. While the theoretical foundation of the German system—the determined promotion of recycling—warrants many of the same charges of myopia that the United States proposals did, the involvement of consumers in the recycling process is an important difference. Not only will the system lead to the same efficiencies in packaging management that the United States proposals would have, but the German people may also internalize general lessons of how to interact with a world of limited resources. By teaching these lessons, the German system may lead both to better MSW management and to generally more environmentally conscientious behavior.

2. The European Union Packaging Directive

In the interest of reducing solid waste and removing the barriers to trade that national packaging laws like Germany's may create, the EU is now on the verge of adopting a Directive on Packaging and Packaging Waste (DPPW).\(^{291}\) With this directive, the EU seeks to compel member states to enact packaging legislation modeled after the German ordinance.

a. The Structure of the Proposal

Although its timetable is much more modest than that of the German law, the DPPW's goals are comparably ambitious. Within 5 years after the directive takes effect, 60% of all waste will have to be recovered\(^{292}\) and 40% by weight of each material will have to be re-


\(^{292}\) See id. at art. 4, para. 1(a). Unlike the German law, under the EU directive "recovery" includes waste-to-energy incineration. The EU's stance on incineration has infuriated environmental groups and has in part caused parties to oppose the EU directive.
Ten years after the directive takes force, member nations will have to recover 90% of all packaging waste and recycle 60% of it. Within 5 years after the directive takes effect, states must set up systems like the German DSD to facilitate the collection of all used consumer packaging and to ensure that the packaging is reused or recovered. The DPPW will also set strict limits on the allowable concentrations of lead, cadmium, mercury, and hexavalent chromium in packaging.

Among the other mandatory requirements of the EU directive are marking requirements and "essential" design and composition requirements. No later than 5 years after enforcement of the directive, all packaging must feature a harmonized system of marking to indicate its reusable or recoverable character and, if need be, the type of packaging material used. Like the German green dot, the EU markings for reusable and recoverable packaging will indicate that the packaging complies with the requirements of the law and is subject to established return and management systems. Unlike the recovery rates in the proposed United States packaging bills, the "essential requirements on the composition and the reusable and recoverable nature of packaging" set out in the EU directive are extremely vague. For example, the section on the composition of packaging reads: "Packaging shall be designed, produced and commercialized in such a way as to permit its reuse or recovery and to minimize its impact on the environment ...." Member states will have to deny market access to packaging that fails to respect the essential requirements.

The proposed EU law requires member states to set up databases on packaging and packaging waste in order to facilitate the development of packaging and packaging waste management policies. It also, in unspecific terms, mandates that states provide consumers with

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294. *Id.*

295. *Id.* at art. 5.

296. *Id.* at annex II, para. 1.

297. *Id.* at art. 6. For examples of required markings, see *id.* at annex I.

298. *Id.* at art. 6, para. 2.

299. See *id.* at annex II.

300. *Id.* at annex II, para. 1.

301. See *id.* at art. 7.

302. The stated purposes for the databases are:

- to provide information on the magnitude, characteristics and evolution of the packaging and packaging waste flows at the level of individual Member States,
- to provide information on the economic parameters related to packaging and packaging waste management, [and]
- to provide information in order to be able to re-examine targets, to design the most appropriate measures to attain them and to evaluate their effectiveness.

*Id.* at art. 8, para. 2.
information about "the advantages of using reusable and recoverable packaging, about the meaning of the markings on packaging, [and] about the return systems available for them to dispose of their used packaging ...." 303

European environmentalists have denounced the DPPW. While the European Commission initially favored setting a quantitative limit for packaging waste of 150 kg per person per year, the actual proposal sets recovery and recycling targets; the European Parliament’s Greens have argued that these targets will allow the MSW stream to increase. 304 However, the Greens appear to ignore the possibility that, as appears to have occurred in Germany, waste will be reduced as private industry bears more of the cost of handling it. 305

Another source of contention is the European Commission’s decision to base the directive on Article 100a of the EU Treaty, 306 the so-called Harmonization Article, and not Article 130s, which specifically discusses environmental protection. 307 This means that member states will have less leeway to impose their own stringent environmental measures. 308 However, the Commission will confirm more stringent measures if they are not a means of arbitrary discrimination or a disguised restriction on trade. 309

Environmentalists have also taken issue with the fact that "recoverable" packaging under the law includes packaging burned in waste-to-energy facilities. The law in its current form implicitly places incineration on an equal footing with reuse and recycling when it states: "[A]s long as life-cycle assessments justify no clear hierarchy, reusable packaging and recoverable packaging waste and, in particular, recyclable packaging waste, are to be considered as equally valid methods for reducing the environmental impact of packaging ...." 310

b. Assessment of the Proposed European Union Model

Because the DPPW is primarily a framework within which indigenous "German models" are to be established in the other EU member

303. Id. at art. 9.
305. See supra note 277 and accompanying text.
306. TREATY ESTABLISHING THE EUROPEAN ECONOMIC COMMUNITY [EEC TREATY] art. 100a, amended by TREATY ON EUROPEAN UNION [EU TREATY].
307. Id. at art. 130s.
308. For a discussion of the effects of the EU Treaty on environmental policy in member states and in the EU, see Martin Hession & Richard Macrory, Maastrict and the Environmental Policy of the Community: Legal Issues of a New Environment Policy, in LEGAL ISSUES OF THE MAASTRICHT TREATY 151, 151-67 (David O’Keeffe & Patrick M. Twomey eds., 1994).
309. EEC TREATY art. 100a, para. 4, amended by EU TREATY.
states, it is difficult to assess the DPPW as a distinct set of regulations. Most of the broad criticisms and praise that we directed at the German model presumably would also apply to the EU model.

The primary objective of the European Commission's directive is to create an atmosphere supportive of coordinated packaging legislation, and the DPPW appears to be a serious attempt to do this in an environmentally protective manner. That the timetable of the directive for meeting target recovery rates is more modest than that of the German model does not significantly detract from this conclusion; indeed, ensuring a reasonable atmosphere for compliance by the greatest number of member states seems a more sound approach than the ambitious German model. Of course, this coordination should have the effect of nurturing a series of national packaging schemes that will not be subject to charges of protectionism within the EU.

By approaching the coordination of packaging legislation as a process of education—by mandating coordinated, though flexible, labelling laws, design standards, and public education, as well as by providing access to databases of design technology—the directive shows a commitment both to promotion of efficient packaging use and to bringing that change about by means other than market incentives.

The EU model, primarily because it is a framework that does not focus on individual behavior, provides few opportunities for consumers to connect directly with the MSW management process. One primary exception to this is the clear emphasis on education that the directive supports. On a more abstract level, the creative groundbreaking that the EU directive will achieve in the area of trade and the environment is, in itself, a promising aspect of the existence of the directive. The process of making environmentally protective laws often provides the necessary context, basis, and examples for societal understanding of environmental issues. Even policy statements such as the DPPW serve to connect people to environmental protection.

C. Lessons from the Initial Attempts To Regulate Packaging

Although the German directive has only recently gone into full effect, and the United States and EU proposals have yet to become law, these first efforts will no doubt influence any future attempts to

311. See id. at para. 8.
312. Similarly, to the extent that reliance on Article 100a instead of Article 130s lessens a member state's creativity and flexibility to successfully promulgate and enforce its own packaging legislation, the Directive on Packaging and Packaging Waste (DPPW) is not as environmentally protective as it could be. However, it is not clear that this potential weakness is significant.
313. Harmonization within the EU, while an important step in the attempt to defuse trade issues associated with packaging legislation, will not affect efforts by governments and companies based in nonmember states to assert claims of EU protectionism.
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regulate packaging. Based on the assessment scheme utilized in this article, the following components appear to be potential elements of an environmentally protective packaging management plan.

All three examined systems protected the environment to the extent that they properly balanced the strength of CAC and market-based management tools in a mixed system. They all succeeded, to various degrees, because they incorporated a mandatory standard of behavior as the baseline objective. Whether it was the recovery rates mandated in the United States bills or the recycling rates of the European plans, standards issued by the central government defined environmental protection for each strategy. Because the legislatures in question (i.e., the United States Congress, the German Legislature, and the European Commission) are constituent bodies, the standards can be understood to truly reflect a polity-specific concept of environmental protection.

The three systems all lack a mechanism for periodic review and amendment of the standards, without which the mandatory standard of environmental protection may become random and irrelevant over time. An important benefit of periodic review is that each reassessment of the concept of environmental protection, within the context of packaging management, is another opportunity to get individuals involved in environmental policy and to engage in public education.

Another important lesson apparent even in the few examples discussed in this article is that a mandatory standard will most efficiently be achieved when the regulated community is afforded flexibility in the range of techniques it may use to comply with the law. Whether this flexibility is delimited by a list of options, as it is in the United States plans, or by market mechanisms, as would be the case with a tradeable permit scheme or under the European plans, the greater the flexibility, the more probable it is that creativity and efficiency will be nurtured.

The strength of each of the three systems is to a large degree dependent on how well they make important constituencies responsible for the success of the law. It is clear that manufacturers must be given incentives to internalize the costs of packaging production; the closer to extraction that the cost of a product’s ultimate disposal is internalized, the more protected the environment will be against the degradation associated with MSW disposal. A role for retailers and other “primary consumers” must also be included in any framework for effective packaging if the connection between consumption and production is to be fully realized. Final consumers—that is, “the people”—must have a stake in the success of packaging management. Citizen enforcement, source separation or “unpackaging,” policy education, inclusion in the policymaking process, and widespread use of
informational tools are all ways by which citizens will be able to learn to make environmentally informed choices in their consumption, as well as to ensure that the regulations operate to achieve environmental protection.

Last, it is important to differentiate between the startup costs of a regulatory program and inherent weaknesses in the program. Specifically, packaging management will remain economically inefficient unless markets can produce a demand for recovered materials. If legislators want to ensure that packaging management strategies are not only environmentally protective but also economically viable, government incentives of some sort (e.g., tax breaks or startup grants) will be needed in the areas of materials technology and recycling research and development. Startup costs need not be as daunting as the German model might suggest. Although a DSD-type system might be necessary if the United States were to recycle at the rate Germany intends to, collection and sorting at more modest rates could probably be achieved by existing municipal systems more efficiently because massive startup expenditures would not be needed.

CONCLUSION

For several reasons, national packaging regulation merits serious attention. First, a law that reduces wasteful packaging and diverts unavoidable packaging back into the manufacturing process can help to ameliorate the difficulties in MSW waste disposal. Second, packaging regulation can quickly create markets for recovered materials, the lack of which poses a significant impediment to environmentally protective MSW management in the United States. Third, a properly drafted packaging law could significantly reduce the environmental impacts of packaging during production, where most of the adverse effects of packaging occur.

What can we hope for in a national packaging policy? We can hope for a policy that is rational and responsive to the full scope of human needs. Common sense and practical experience suggest that such a policy cannot be fully reflected in economic models. However, nonmonetary values are often discounted precisely because they are not quantifiable, rather than being a summons to refine policymaking so that the process captures human concerns regarding environmental concerns.

In our governing system, common needs are best protected when the national government, reflecting the will of the majority but respecting the rights of the minorities, defines parameters of acceptable behavior. After such parameters are set, individuals and companies should have the freedom to comply in any way that does not under-
mine the common will. It follows that regulatory standards should form the basis for a reduction of the environmental impacts of packaging in the United States. Such a framework, which employs such mechanisms as mandatory weight reduction or recycled content standards, and which encourages reuse where feasible, is the best way to alter wasteful packaging practices and to develop markets for recovered materials. So as not to penalize companies whose products are already streamlined or who may have developed effective technologies for meeting the standards, and to keep enforcement costs at a minimum, the law should encourage varied and flexible compliance strategies. Furthermore, any new legislation can go further than the proposed amendments to RCRA and actually reward overcompliance by creating tradeable rights in packaging material and recycled content.

A combination of modest regulatory standards, flexible compliance options, and tradeable credits may hold the most promise for promptly alleviating solid waste disposal problems and reducing the environmental impacts of packaging production in the United States. Reasonable packaging design and content standards would challenge companies to streamline their packages and would spur the investment in recycling that is essential if secondary materials are to compete with their virgin counterparts. A tradeable credit component would give companies an incentive to look beyond the short-term standards and would reduce the inefficiencies that inevitably result when inflexible targets are set without regard for the relative abilities of companies to meet those targets.

However, while specific proposals for a national packaging policy are necessary to bring us closer to a system that is both efficient and environmentally protective, it is important not to lose sight of the broader goals of environmental policy. In this article we have suggested that attempts to regulate behavior in a manner that protects the environment must focus on reconnecting human behavior with the results of those actions. In particular, we have suggested that environmentally protective environmental policy must: (1) promote environmental protection as a value in itself; (2) maintain or reestablish the connection between individual behavior and collective needs; and (3) be understood as a link between individual desires, collective needs, and environmental integrity. Only when such goals become the centerpiece of environmental policy in the United States will there be a foundation of environmental policy that is rational, responds to the full scope of human needs, and reflects a comprehensive vision of environmental protection.