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PLASTICS RECYCLING LEGISLATION: NOT JUST THE SAME OLD GARBAGE

ANTHONY R. DEPAOLO*

I. INTRODUCTION

Curbside collection of recyclable plastic waste is working well in Southern California—too well. Apparently, the lack of market demand for much of the plastic recovered via the collection program has created a glut of plastic. 50,000 pounds of collected and separated plastic was “quietly” landfilled after being stored by various recyclers for months. Recyclers could not even give the plastic away. “[I]f recycling markets aren’t legislated,” says a recycling industry executive, “they won’t happen.”

The market failure for plastic recycled materials has caused an outcry for government to step in and “fix” the market. The recent government response is the latest chapter in the evolution of society’s attempts at recycling. The earliest plastic recycling legislation was created to solve litter and solid waste problems. Diverting these materials from landfills created a new source of supply for plastics, and a new impetus for recycling them. Innovative businesses relied upon recycled plastic as a raw material source for their products. This demand, however, did not lead to country-wide growth in plastics recycling. The latest, and strongest, impetus for plastics recycling came about from a renewed sense of environmental awareness, which was in turn spurred by the increasing cost of disposal and decreasing landfill space.

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2 Id. (comment by Tom Tomaszek, President of North American Recycling).
Government responded to the renewed outcry for recycling by creating comprehensive recycling laws aimed at reducing the amount of waste being landfilled. The diversion of plastics from the waste stream worked well, but the adequate demand did not exist for reuse of these diverted materials. Thus came the latest wrinkle in the recycling story: the impetus for creation of market demand legislation.

This Comment will trace and analyze the development of plastics recycling legislation. Section II will give a brief history of recycling in general and will discuss the technical aspects of plastic recycling. Section III will discuss “supply side” recycling legislation. Section IV will discuss the development of existing “demand side” plastics recycling legislation. Section V will discuss proposals for new “demand side” legislation. Section VI will analyze these developments and assess what would be the best response to recycling problems.

II. BACKGROUND INFORMATION

A. The Origins of Recycling

Recycling is not a modern phenomenon. The first known recycling occurred in China around 100 A.D., when Ts'ai Lun invented paper by using reclaimed rags, worn fishnets, hemp, and china grass. The earliest recycling came about not for environmental purposes, but for necessity. The most prominent example of the necessity of recycling in the 20th century occurred in America during World War II, where shortages of strategic resources triggered large scale collection and recycling of scrap metals and paper. Recycling as necessity, however, died out after the end of the war. Consequently, so did the effort to recycle, as the country shifted into the “throw away” mentality with the economic boom of the 1950s and 1960s.

Modern recycling efforts aimed at environmental concerns originated from the so-called “counter culture” of the late 1960s. Recycling efforts started in cities and college campuses in response to the pro-

4 See id. at 2. For example, in 1776 a statue of King George III was toppled and turned into 42,088 bullets for the colonists during the Revolutionary War. Id. at 20.
5 See id. at 2. Strong anti-Axis rhetoric fueled the recycling effort, including such slogans as “If you have a few pounds of scrap metal in your home, you are aiding the Axis,” and “if you think you have given all your scrap metal, look again more thoroughly. Think of each piece of metal as guns to defend your home.” Tom Watson, Recycling in the 1990s: New Horizons, Fast Pace, in Recycling Sourcebook 1, 3 (Thomas J. Cichonski & Karen Hill eds., 1993).
6 See Kimball, supra note 3, at 2.
7 Watson, supra note 5, at 3.
liferation of the "throw away society." Recycling and other anti-litter activities were a major part of the first Earth Day in 1970. The passage of the first bottle bill in Oregon in 1971 highlighted the new concern for recycling. These efforts, however, were few and far between as low waste disposal costs and low economic incentives kept recycling concerns at a minimum.

While the 1970s was a slow period for recycling, the decade saw the development of recycling induced by economic considerations. The few businesses that were engaged in recycling were making a profit because of the relatively small supply and large demand for the materials that they produced. At this point, however, environmental concerns were a secondary concern—"a bonus point to sell the idea." Throughout this period, the bottle bill remained the sole major legislation aimed at recycling plastic.

B. The Technical, Practical, and Economic Aspects of Recycling Plastic

Plastic makes up a significant amount of the waste stream and plays an important role in consumer goods. As of 1993, plastics made up twenty-one percent by volume and ten percent by weight of landfilled wastes. There are six resins that account for ninety-seven percent of the plastics used in packaging: polyethylene terephthalate (PET), used in soft drink bottles; high density polyethylene (HDPE), used in milk, juice, and laundry product bottles; polyvinyl chloride (PVC), used in cooking oil and water bottles and film for meat packaging; low density polyethylene (LDPE), used in film products such as bags, or in tubs for ice cream or margarine; polypropylene (PP), used in yogurt cups and ketchup bottles; and polystyrene (PS), a plastic that in its rigid clear form is used for salad containers, or in its foamed form is used to improve insulating properties in food containers.

The recycling of PET is by far the most successful. In 1992, 23.8% of all PET sales, and 41.5% of total sales of PET soft drink bottles,

8 See id.
9 KIMBALL, supra note 3, at 22.
10 Watson, supra note 5, at 3.
11 KIMBALL, supra note 3, at 3.
12 See id.
13 Id.
15 Id. at 3–4.
was recycled plastic made from recovered PET.\textsuperscript{16} HDPE was the next most successful, with sales of recycled HDPE occurring at a five percent rate.\textsuperscript{17} PP was recycled at a three percent rate, while LDPE, PVC, and PS were all recycled at less than a one percent rate.\textsuperscript{18}

There are four basic steps to successful plastics recycling: collection, handling, reclamation, and end use.\textsuperscript{19} Success, or lack thereof, in recycling plastic has depended in part on the efficiency of carrying out these stages. Accordingly, the following analyzes each step in the process.

1. Collection

Plastics are collected for recycling in three ways: curbside collection programs,\textsuperscript{20} drop-off recycling centers,\textsuperscript{21} and buy-back programs, often called “bottle bills.”\textsuperscript{22} Initially, collection issues were a problem, as many early plastic recyclers complained that their lack of steady supply of recovered materials was preventing them from making bigger profits.\textsuperscript{23} Where supply of recovered plastics was steady and reliable, however, such as for PET, successful recycling rates were

\textsuperscript{16} R.W. Beck & Assocs., American Plastics Council, Post Consumer Plastics Recycling Rates of 1991 and 1992 ES-5 (1993). These rates were based on percentage of total sales made up of recycled materials. PET's recycling success can be attributed to many factors. First, recycled PET is cost-competitive because it can be made at about two-thirds the cost of virgin PET. See Sidney Rankin, Plastics Recycling, in Recycling Sourcebook 50 (Thomas J. Cichonski & Karen Hill eds., 1993). In addition, recycled PET can be produced with virtually the same purity as the virgin material, thus eliminating many technical processing problems. See id.

\textsuperscript{17} R.W. Beck & Assocs., supra note 16, at ES-5. HDPE has had mixed recycling success. Proctor & Gamble (manufacturers of such brands as Tide, Cheer, Era, Dash, and Downy) and Lever Brothers (manufacturers of such brand names as Wisk, All, Final Touch, and Snuggle) each committed to making sixty-four ounce or larger bottles from at least 25% recycled HDPE. See Hannah Holmes, Recycling Plastic, Garbage Jan./Feb. 1991, available in LEXIS, News Library, ARCNWS File. Recycled HDPE, however, has trouble competing with virgin HDPE because it costs virtually the same to produce recycled and virgin HDPE. During the 1991–1992 period, high quality HDPE sold for about $0.40 per pound, about $0.05 higher than it needed to be in order to be profitable. See Rankin, supra note 16, at 50. In addition, recycled HDPE has quality control problems that limit its ability to be reused. See infra note 37 and accompanying text.


\textsuperscript{19} American Plastics Council, supra note 14, at 10.

\textsuperscript{20} Rankin, supra note 16, at 43.

\textsuperscript{21} Id.

\textsuperscript{22} See infra notes 49–66 and accompanying text.

attained. With the entrenchment of the bottle bill and the proliferation of curbside collection programs as part of comprehensive recycling laws, the collection aspect of supply was no longer the main hindrance to recycling efforts.

2. Handling

Handling of recovered plastics involves two processes: sorting and compacting. To prevent contamination, recovered plastic must be sorted into groups by resin type, otherwise the required performance properties of the end product will be compromised. Mixed plastics are usually taken to a Material Recovery Facility (MRF) for sorting and separation by color and resin type. The separation process has been aided by the use of the SPI resin coding system, which has been adopted in thirty-nine states. Separating plastics into groups, however, is an expensive process because there is not enough sophisticated machinery to do the work, so it must be done by hand.

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24 The high rates of PET recycling has been attributed in part to over ten years of bottle bills, which have given recyclers a steady supply of reclaimed material and have allowed the recycled PET market to develop. Holmes, supra note 17, at 36.

25 See discussion infra Section III.

26 See supra note 1 and accompanying text.

27 See American Plastics Council, supra note 14, at 10.

28 See id.; see also The Problems with Plastics, Consumer Rep., Feb. 1994, at 96, 96. For example, mixing one bottle of PVC into a batch of PET—both of which are clear rigid containers—can alter the performance properties of the PET so that the PVC will ruin a batch of 10,000 reprocessed PET bottles. See id.

29 Rankin, supra note 16, at 43.

30 The Society of the Plastics Industry (SPI) developed a seven-part code which would be displayed on the plastic product according to its resin content. See Rankin, supra note 16, at 41. The symbol is three chasing arrows surrounding a number signifying the resin type: 1 for PET, 2 for HDPE, 3 for PVC, 4 for LDPE, 5 for PP, 6 for PS, and 7 for all other resins and multi-layered products. Id. The code, however, is under attack from both environmentalists and recyclers, because, (1) the code is being misinterpreted as signifying a recycled or recyclable product, and (2) the code does not distinguish plastic types adequately to prevent mixing of incompatible resins. See Jonathan Gardner, SPI, NRC Wants To Revamp Recycling Code, Plastics News, Dec. 13, 1993, at 1, 20. As a result, the SPI and the National Recycling Coalition (NRC), a nonprofit group representing recycling interests, are in the process of adopting a new code that will remedy the problems with the old code. See id. For related issues, see Jonathan Gardner, Recyclers Reject New SPI Code Proposals, Plastics News, Jan. 17, 1994, at 6.


32 See The Problems with Plastics, supra note 28, at 96. While machinery is being developed to speed up the sorting process, most sorting involves the use of workers to hand identify the resin via the SPI code and separating the resin into appropriate groups. Id. One manufacturer claimed that this process had to be done five times to achieve accurate separation, which he called "three or four times too many." Id.
technology is improving, separation continues to be a problem which recyclers must confront and solve. In addition, recovered plastic must be compacted so that it can efficiently be transported to and utilized by recyclers. Plastics are bulky and contain much air space, which increases the transportation and storage costs; compaction alleviates some of these problems.

3. Reclamation

Reclamation of recovered plastics, which involves chopping, washing, and converting the sorted plastics into flakes or pellets, also poses problems for recyclers. Recovered plastics are not always easy to clean sufficiently to meet minimum quality standards, especially for food packaging. Cleaning problems, however, are only a problem for single resin type recycling, as commingled plastics do not need to be cleaned to be recycled.

33 For instance, Eaglebrook Plastics, using technology developed by Magnetic Separation Systems, Inc., installed the nation's first commercial system for automatic sorting of plastic bottles in its Chicago plant. The sorting system can sort five different kinds of clear and colored plastic, can handle 35 million pounds of commingled plastic a year, and has sorted up to 5,000 bottles per hour at a rate of 1250 pounds per hour. See AMERICAN PLASTICS COUNCIL, PROGRESS IN PLASTICS RECYCLING 2 (1993). Another machine can separate PVC from PET via centrifugal force because the two resins have different densities. See Robert F. Stone et al., Recycling the Plastic Package, TECHNOLOGY REV., July 1992, at 48, 52-53.

34 See The Problems with Plastics, supra note 28, at 96.

35 See id. Waste Management Inc., the largest private garbage disposal company in the country, has calculated that plastic makes up only three percent by weight of all collected material, but takes up 30% of recycling costs. See id. This also poses a problem for collection, as plastic taking up only five percent of the weight in a truck may take up 30% to 50% of the truck's storage volume, thus increasing the number of collection trips. See Holmes, supra note 17.

36 See Holmes, supra note 17.

37 See The Problems with Plastics, supra note 28, at 96. A good example of the problems associated with cleaning recovered plastic is HDPE. HDPE, which is used to hold products such as milk and weed killer, is somewhat porous and will absorb whatever is put into it. Id. at 96-97. As a result, the use of recycled HDPE in food packaging is limited by the FDA. Id. To remedy this problem, companies would sandwich layers of virgin HDPE around a thicker layer of recycled HDPE, thus utilizing recovered material but meeting FDA standards. See id. at 96. Nevertheless, cleaning disadvantages the recyclability of HDPE because HDPE cleaning problems prevent HDPE from being closed-loop recycled, a problem that PET does not have. See Rankin, supra note 16, at 50. “Closed-loop” recycling consists of three elements: collecting the recyclable material, processing the same material and making it into a new product, and marketing and actually using that product. Watson, supra note 5, at 4. The loop is closed—and “true recycling has taken place”—when the new product is marketed and used. Id.

38 See Rankin, supra note 16, at 48.
4. End Use

Besides separation, end use processing poses the greatest obstacles to successful plastics recycling. Plastic cannot be recycled forever because every time plastic is reprocessed, its polymers break down, lowering the quality of the performance standards for the recycled product. In addition, contaminants, which can prevent products made from recycled material from meeting required performance standards, are a problem because plastic is not processed at a high enough temperature to eliminate impurities in the recovered material. Furthermore, reuse of colored plastics is limited because it can only be reprocessed into a limited amount of colors.

5. Practical and Economic Advantages

Despite the technological and economic problems associated with the recycling process, plastics recycling offers many benefits. For instance, the amount of energy needed to process recycled plastics is much lower than that needed to process virgin materials. Because plastic makes up a significant part of the waste stream in the United States, recycling plastics helps society to avoid growing incineration and landfill costs. For example, MassPIRG, a Massachusetts public interest research group, determined that once all pertinent factors were added together, recycling waste lessened incineration...
costs at the rate of $202 per ton\textsuperscript{46} and lessened landfill costs at a rate of $63 per ton.\textsuperscript{47} Furthermore, while it is arguable that increasing the market for recycled products would reduce jobs in the virgin industries, these losses would be offset by jobs created within the recycling infrastructure.\textsuperscript{48}

III. THE LAWS OF SUPPLY

A. The Bottle Bill

The first laws aimed at recycling plastics were the beverage container deposit laws, commonly known as bottle bills.\textsuperscript{49} States enacted bottle bills to alleviate litter and solid waste problems, although health and safety and resource conservation concerns were also paramount.\textsuperscript{50} Bottle bills were designed to provide a monetary incentive for consumers to keep bottles out of the waste stream.\textsuperscript{51} During the 1970s and early 1980s, bottle bills came under much criticism\textsuperscript{52} and were fought in court,\textsuperscript{53} but they survived constitutional challenges and continue to thrive today.\textsuperscript{54}

Currently, ten states have container deposit laws.\textsuperscript{55} Traditional bottle bills require a five-cent deposit on the sale of carbonated beverages

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\textsuperscript{46} See id. at 17. The landfill costs avoided by recycling is based upon adding up all relevant costs for incinerating waste and multiplying that figure by 70\%—the percentage of solid waste expected to be incinerated in Massachusetts. See id.

\textsuperscript{47} See id. at 20. For a full explanation of how this study was conducted, see id. at 1–23 (Part I).

\textsuperscript{48} A study by the Institute for Local Self-Reliance (ILSR) determined that sorting and processing recovered materials would create nine times as many jobs as landfilling. The study determined that for every 15,000 pounds of solid waste landfilled every year, one job was created. For a similar amount of waste recycled, nine jobs were created in sorting and processing. See RECYCLING ADVISORY COUNCIL, INDUSTRY AND INTEREST GROUP PANE\textsuperscript{DISCUSSION}ION ON RECYCLING MARKET DEVELOPMENT POLICY OPTIONS 24 (1993) (comments by Michael Lewis of the ILSR).

\textsuperscript{49} See supra note 9 and accompanying text.


\textsuperscript{51} See Wagenbach, supra note 50, at 760 n.6.

\textsuperscript{52} Critics disliked the bottle bill because they thought that the bottle bill both would cause employment loss in the beverage industry and raise both the price of beverage to consumers and overall handling costs. See id. at 765–73.

\textsuperscript{53} For an excellent analysis of early challenges to bottle bills, see id. at 779–85.

\textsuperscript{54} See id.

\textsuperscript{55} CAL. PUB. RES. CODE § 14560 (Deering 1993); CONN. GEN. STAT. §§ 22a-243 to -246 (1992); DEL. CODE ANN. tit. 7, §§ 6051–6062 (1993); IOWA CODE §§ 455C.1–16 (1993); ME. REV. STAT. ANN. tit. 32, §§ 1861–1873 (West 1993); MASS. GEN. LAWS ANN. ch. 94, §§ 321–327 (West 1993);
sold in plastic containers, although there are variations on the amount of deposit. The beverage distributor initiates the deposit, which the consumer pays to the retailer. The retailer is then required to accept returned containers of all brands that it sells, and refund the deposit charge to the customer.

California, however, has put a new twist on its bottle bill. California requires distributors to pay to the state a 2.5-cent deposit on each plastic beverage container. Containers with a capacity of twenty-four ounces or greater count as two containers. The redemption value for consumers is five cents per container. The deposit amount and redemption value per container, however, increase if certain minimum redemption rates are not met.

The California bottle bill differs from traditional bottle bills in many other ways. Under the California law, distributors pay the deposits directly to the state, while deposits are held by distributors under traditional bottle bills. In addition, any unclaimed deposits are retained by the state, while distributors usually get to retain unclaimed deposits under traditional bottle bills. Furthermore, manufacturers are required to pay California the balance between recycling costs and the scrap value of the recovered plastic.

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56 See, e.g., CONN. GEN. STAT. § 22a-244(a) (1992). Michigan, however, puts a ten cent deposit on its plastic bottles sold in the state. MICH. COMP. LAWS § 445.572(7) (1992).
57 See, e.g., CONN. GEN. STAT. § 22a-245(b); Wagenbach, supra note 50, at 761-65.
58 CAL. PUB. RES. CODE § 14560(a) (Deering 1993).
59 CAL. PUB. RES. CODE § 14560(b) (Deering 1993).
60 The deposit will increase to three cents and the redemption rate to five cents per container if redemption rates are reported below 65% over set periods. CAL. PUB. RES. CODE § 14560(c)-(d) (Deering 1993). In addition, distributors are required to pay out three cent deposits if a certain beverage type is redeemed below 65% and the containers are accepted at 70% of curbside collection programs. Id. § 14560(f). If redemption rates again achieve the target goals of the statute, the deposit will be decreased. Id. § 14560(h).
61 Compare CAL. PUB. RES. CODE § 14574 (distributor pays deposit to state) with, e.g., CONN. GEN. STAT. § 22a-245(c) (1992) (distributor holds deposits for refunds to dealers and redemption center operators).
62 Compare CAL. PUB. RES. CODE § 14580 (Deering 1993) (state retains unclaimed deposits) with, e.g., CONN. GEN. STAT. § 22a-243 to -246 (1992) (no mention of who gets to keep unclaimed deposits, thus distributors retain them). However, courts in both Massachusetts and Maine have held that the state government is entitled to unclaimed deposits held by distributors. See Maine Beer & Wine Wholesalers Ass'n, Inc. v. Maine, 619 A.2d 94 (Me. 1993); Massachusetts Wholesalers of Malt Beverages, Inc. v. Massachusetts, 609 N.E.2d 67 (Mass. 1993). In California, unclaimed deposits have been used to fund city grants, recycling programs, and the California Conservation Corps. See RAYMOND COMMUNICATIONS, supra note 31, at 13.
63 CAL. PUB. RES. CODE § 14660(e) (Deering 1983). This requirement has been a problem for plastics recycling in California. For example, the discrepancy between recycling costs and the scrap value of PET has been so high that plastic firms are paying an artificially high price for...
Despite contentions from the beverage industry that deposit legislation is inefficient and costly to consumers, it has done much to advance the success of plastics recycling. For example, the bottle bill has facilitated the creation of a steady and successful market for PET by creating a steady source of supply of recovered bottles that can be recycled by manufacturers. In addition, bottle bill states have been responsible for the vast majority of recovered plastic.

B. Comprehensive Recycling Legislation—Curbside Collection.

A post-bottle bill increase in perceived solid waste management problems led to a new surge in recycling legislation. Sharp increases in disposal costs and decreasing landfill space coincided with a renewed environmental awareness to bring recycling issues to the forefront. The result was the growth of a new generation of supply-side recycling laws at the state level: curbside collection programs as part of comprehensive recycling goal legislation.

Statewide comprehensive recycling goal legislation is the most common type of legislation that serves to recycle plastics. Under comprehensive recycling legislation, states set general recycling or waste reduction goals expressed in a percentage rate and a target year to reach the goal. A main component of many of these laws is curbside collection programs. Curbside collection requires citizens to remove PET scrap to avoid handling fees, thus imposing burdensome costs on PET bottlers. See Raymond Communications, supra note 31, at 13.

64 Soft drink and beer companies have always strongly been opposed to bottle bills and have spent millions of dollars over the past ten years to fight the passage of bottle bill legislation. See Raymond Communications, supra note 31, at 13.

65 See id.

66 According to the Container Recycling Institute, states with bottle bill legislation have accounted for 95% of recycled plastic. Id.

67 See Watson, supra note 5, at 3.


69 See id. The most famous incident associated with the new outcry for solutions to solid waste problems was the fate of the Mobro, a garbage barge that traveled 6,000 miles in six months before it found a place to dispose its cargo. See id. As it turned out, the Mobro’s journey was brought upon by greed, as an owner’s “get rich quick” plan to score a maximum tipping fee backfired. See Patricia Poore, Is Garbage an Environmental Problem?, Garbage, Nov./Dec. 1993, at 40, 40.

70 See Watson, supra note 5, at 3–4.


designated materials from their garbage, separate the materials by group, and put the materials in special containers.\footnote{See Rankin, \textit{supra} note 16, at 43; \textit{Recycling: Is It Worth the Effort?}, \textit{supra} note 43, at 92--93.} These containers are then placed by the curbside, where special trucks collect and separate the recovered materials and carry them to an MRF.\footnote{See Rankin, \textit{supra} note 16, at 43; \textit{Recycling: Is It Worth the Effort?}, \textit{supra} note 43, at 92--93.} The materials are then further separated at the MRF, compacted to facilitate shipping and grinding, and finally purchased and reused by manufacturers.\footnote{See Rankin, \textit{supra} note 16, at 43; \textit{Recycling: Is It Worth the Effort?}, \textit{supra} note 43, at 92--93.}

Most of these comprehensive laws allow communities to choose which materials to recycle, but some set statewide mandates of what materials are to be recycled.\footnote{See Rankin, \textit{supra} note 16, at 44.} Laws that allow community choices, however, can pose a problem for plastics recycling, as most communities choose to recycle materials such as aluminum and newspaper, which are easiest to recycle, and avoid recycling plastic, which is more difficult to recycle.\footnote{See \textit{id. at 43; Recycling's Pros and Cons, Consumer Rep., Feb. 1994, at 94, 94. Aluminum and newspaper are easier to recycle than plastic because recovered and recycled aluminum and newspaper are in greater demand, are easier to handle and separate, and do not pose the same contamination problems as does recovered and recycled plastic. See \textit{Recycling's Pros and Cons, supra} at 94.} As of 1992, 6,600 communities collected and separated plastics from the waste stream, with about 3,900 collecting plastics via curbside collection programs—2,300 of these communities also have drop-off centers—and 2,700 communities collect plastics at drop-off centers.\footnote{AMERICAN PLASTICS COUNCIL, \textit{supra} note 14, at 11. (citing R.W. Beck & Associates' March 1993 survey "1992 Post-Consumer Plastics Collection Survey").}

The reduction rates and reduction goals of these supply-side laws vary according to local conditions and preferences. The rates extend from twenty percent recycling and reduction for Maryland, to the much more ambitious goal of seventy percent recycling and reduction for Rhode Island.\footnote{MD. ENVIR. CODE ANN. § 9-505(18) (1994); R.I. GEN. LAWS § 23-19-3(10) (1994). See generally RAYMOND COMMUNICATIONS, \textit{supra} note 31, at chart "State Recycling Goals, Progress, and Budgets, January 1994."} As of January 1994, forty-one states and Washington, D.C., had set recycling and reduction goals.\footnote{E.g., CAL. PUB. RES. CODE § 41780 (Deering 1995); FLA. STAT. chs. 187.201(13), 403.706 (1994); IOWA CODE §§ 455D.2--5 (1993). See generally RAYMOND COMMUNICATIONS, \textit{supra} note 31, at chart "State Recycling Goals, Progress, and Budgets, January 1994."} Of these states, thirty-seven had set target dates to reach the goals; thirty-six states made these goals mandatory.\footnote{E.g., CAL. PUB. RES. CODE § 41780(a) (Deering 1995); R.I. GEN. LAWS § 23-19-3(10) (1994); S.C. CODE ANN. § 44-96-50(D) (Law. Co-op. 1993). See generally RAYMOND COMMUNICATIONS, \textit{supra} note 31, at chart "State Recycling Goals, Progress, and Budgets, January 1994."} Of these thirty-six states, eighteen
have provisions for curbside collection of plastics or have set up drop-off centers for plastics. 82

IV. THE LAWS OF DEMAND

Demand-side laws came about because a troubling phenomenon was occurring: materials diverted from the waste stream at great collection and separation costs, which were supposed to eventually be recycled, were nevertheless being disposed of into landfills. 83 While the bottle bill and comprehensive recycling legislation had created an adequate source of recovered plastics to be recycled, true recycling—actually taking the recovered materials and using the materials in new products—was not occurring. 84 Recycling centers were being shut down because operators could not make a profit, thus throwing a wrench into the recycling process. 85 This came about in part because manufacturers had no incentive to use recycled plastic because its price could not compete with the price for virgin plastic. 86

There was an outcry for government response to this glut of supply. 87 It was evident that manufacturers were not going to take the initiative to increase plastics recycling, despite the fact that environmental problems that recycling would help alleviate remained. 88 Thus, both environmentalists and the recycling industry lobbied government to respond to this lack of market demand. 89 The following are

82 E.g., FLA. STAT. ch. 403.706(4), (9); IOWA CODE § 455D.5(2); See generally RAYMOND COMMUNICATIONS, supra note 31, at 57–103 (State-by-state summary of comprehensive recycling laws).
83 See supra note 1 and accompanying text.
86 See supra note 1 and accompanying text. 87 See supra note 1 and accompanying text. 88 See supra note 1 and accompanying text. 89 As one recycling industry executive stated, “[if] [the government is] going to regulate one side of the equation [supply, it should] regulate both sides.” Libby Brydolf, Has Supply-Side Recycling Caused a Glut of Garbage?, SAN DIEGO BUS. J., Apr. 29, 1991, available in LEXIS, News Library, Arcnews File.
some of the policies that have been implemented via government action to address lack of market demand for recycled plastics.\footnote{90}

\section*{A. Tax Incentives}

One means of developing markets for recycled products is by offering tax incentives. Tax incentives help recycling markets by offering exemptions from property and sales taxes to companies utilizing recovered material or purchasing equipment used to manufacture recycled goods.\footnote{91} This encourages the use of goods made from recovered materials and discourages the use of the same goods made from virgin materials.\footnote{92} The intended result of the tax incentives is to increase the amount of products with recycled content available to consumers.\footnote{93} As of December 1993, twenty-seven states had implemented general tax incentive legislation for recycling plastic,\footnote{94} while only Colorado and Oregon had specified recycling of plastic in their legislation.\footnote{95}

Most recycling tax incentive legislation works in one of two ways. Some states offer a tax exemption or credit for use of equipment in the recycling process.\footnote{96} Other states offer a sales tax exemption or income tax credit for the purchase of recycling equipment.\footnote{97} In addition, many statutes require that the purchased machinery be used to recycle a minimum percentage of post-consumer waste.\footnote{98} Lastly, some states require that the machinery be used exclusively for recycling purposes.\footnote{99}

Arizona offers a tax credit equal to ten percent of the installed costs for recycling equipment to both individuals and corporations.\footnote{100} This

\footnote{90} For a discussion of minimum content requirements, a major demand-side policy that has already been implemented at the state level, see discussion infra Section V.A.


\footnote{93} See id.


amount is limited to the lesser of twenty-five percent of the total tax revenue or $5,000.101 The statute prevents owners from taking advantage of the tax credits by requiring that the recycling equipment be in service for the owner to receive the tax credits.102 Furthermore, the statute sets forth a provision to recapture a percentage of the tax credit if the equipment is not used for recycling or is transferred to another person.103

Oregon's recycling tax incentives are similar to the above, but Oregon also allows special credits for plastics recycling.104 Under Oregon's statute, any person or corporation that collects, transports, or processes reclaimed plastic, or manufactures reclaimed plastic products in Oregon, is eligible for the tax credit.105 Oregon, however, limits the eligibility by requiring that the recycled plastic not be an industrial waste generated by the person claiming the credit and be purchased from a plastic recycler other than the person claiming the credit.106 This restriction ensures that the tax credit will actually reduce the amount of solid waste in landfills and place more recycled goods in the market.107

New Jersey recycling tax incentives include a sales tax exemption.108 The statute limits the exemption to equipment used exclusively to sort or prepare solid waste for recycling in the recycling of solid waste.109 In addition, New Jersey offers a fifty percent tax credit for vehicles and machines used in recycling, but limited to equipment used exclusively for recycling, processes only in state solid waste, or manufactured products made from fifty percent post-consumer waste.110

B. Purchasing Preference Legislation

Another method of developing markets for recycled products via legislation is by setting purchasing preference guidelines for governments to buy recycled products. Due to the government's tremendous purchasing power, its purchasing preferences can have a profound effect on product markets.111 Thus, by requiring itself not to discrimi-
that could be purchased by state governments has been estimated at $5 billion. See Raymond Communications, supra note 31, at 37.


cling rates within the state. By increasing the demand for recovered materials, an ADF program is intended to create sufficient incentives for the establishment of the necessary infrastructure to solve litter and solid waste problems. Florida is the only state to have a comprehensive ADF program that regulates plastic.

The ADF program works as follows. An advanced disposal fee is charged to wholesalers for each container sold within the state. The fee goes directly to the state, which uses the fee to cover costs of the ADF program, municipal waste management programs, and other environmental programs. Wholesalers, however, can petition the state for an exemption from the fee if they sell consumer products within a category that meets minimum sustained recycling rates within the state. Thus, in order to avoid the fee, manufacturers and distributors use recovered materials in their consumer products. Although the ADF has been criticized as a tax in disguise that will not positively impact recycling markets or increase recycling rates, critics were content to take a wait-and-see attitude in 1994.

D. Landfill Bans

An indirect method of encouraging the recycling of materials is through banning the disposal of certain products in municipal landfills. The theory is that if the possibility of landfilling the materials is cut off, the most economically intelligent thing to do with the waste is to

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119 See id. ch. 403.7197(1). Florida also expressed a common theme about what is true recycling. The statute states that "recycling has not truly occurred until demand for recovered materials causes those materials to be reused or returned to use in the form of raw materials or products" and acknowledges that creating demand for recycled products is critical to ensuring the success of recycling in the state. Id. ch. 403.7197(5)(a). The intent of the ADF was to ensure the vitality of those groups involved in the recycling infrastructure by increasing the demand for recovered materials. See id.
120 Id. ch. 403.7197. North Carolina has an ADF-like tax on white goods—large appliances like refrigerators—sold in the state. N.C. Gen. Stat. §§ 105-187.20 to .24 (1993). Exemptions are not based upon recycling rates, but upon whether or not the white good contains chlorofluorocarbons. Id. § 105-187.21.
122 Id. ch. 403.7197(6), (10).
123 For plastics, the exemption will be granted if the container is in the category of containers that meet or exceed a sustained recycling rate of 25% or if the wholesaler can demonstrate that the material in the container is used in other products at a 50% rate or remanufactured into like containers at a 25% rate. Id. ch. 403.7197(5)(b)(1)(b), (5)(b)(2)(a). In addition, an exemption will be granted if the container type is being recycled at a sustained rate of 50% within the state. Id. ch. 403.7197(4).
124 Raymond Communications, supra note 31, at 66.
recycle it.\textsuperscript{125} As of the end of 1993, forty-six states had implemented landfill bans of some sort.\textsuperscript{126}

Most of the laws ban landfilling such undesirables as lead acid batteries, tires, and used oil.\textsuperscript{127} A few states, however, have passed landfill bans that have specifically targeted certain kinds of packaging, including some kinds of packaging that are made with plastic.\textsuperscript{128}

V. RAC—THE FUTURE OF MARKET DEVELOPMENT/Demand/Legislation

The Recycling Advisory Council (RAC), a branch of the National Recycling Coalition, is a non profit organization of interested parties in the recycling industry seeking to advance the development of recycling in the United States. RAC established its Market Development Committee to develop strategies for expanding commercial uses of recovered materials and for improving the long-term economics of recycling.\textsuperscript{129} Over the last few years, the Market Development Committee has gathered representatives and input from all sides of the recycling issue to help solve the problem of weak market demand for recycled products.\textsuperscript{130} In 1993, the Committee developed six policy options, called “tier one” options, that had the potential to increase demand for recovered materials: product-specific minimum content re-

\textsuperscript{125} See Watson, supra note 5, at 8. Put in simpler terms, if you cannot throw plastic away, what else can you do with plastic but recycle it?


\textsuperscript{129} The Market Development Committee was created specifically to analyze and recommend public policies and private sector initiatives to increase demand for recovered materials and recycled products; to eliminate economic barriers to increased use for these materials; to promote the establishment of infrastructure needed to increase use of recovered materials; to improve the economic feasibility and sustainability of recycling; and to promote economic development strategies to increase recycling. See Recycling Advisory Council, Executive Summary, in Market Structure Policy Options Briefing Book 1, 1 (1993) [hereinafter Executive Summary].

\textsuperscript{130} Groups include all levels of government, the virgin materials industry, environmental groups, the recycling industry, and nonprofit/public interest groups. See generally Recycling Advisory Council, Market Structure Policy Options Briefing Book (1993) (groups’ perspectives on how to respond to need to increase demand for recycled products dispersed throughout book).
requirements, material-specific utilization requirements, manufacturer's responsibility, taxes on virgin plastics, a national secondary materials utilization trust fund, and shared responsibility.¹³¹

A. Product-Specific Minimum Content Requirements

Product-specific minimum content requirements are the only RAC proposal which has been governmentally implemented for plastics.¹³² Recycled content legislation mandates that manufacturers incorporate in products and packages specified minimum amounts of recovered materials within a set time.¹³³ The purpose of imposing these requirements is to increase demand for recovered materials and promote closed-loop recycling.¹³⁴ This maximizes the energy saving benefits of material recovery and substitution and increases the value of targeted recovered materials.¹³⁵ The minimum content requirements can be measured on a per unit basis or an average percentage of material implementation for a product or package line over a set time.¹³⁶ As of 1992, thirteen states had passed required minimum-recycled content legislation;¹³⁷ of these, three states mandated minimum recycled content for plastics.¹³⁸

Oregon has some of the more ambitious minimum-recycled content legislation for plastic in the country. Oregon requires that manufacturers of rigid plastic containers¹³⁹ offered for sale in the state comply with

¹³¹ See Executive Summary, supra note 129, at 1. In addition, the Committee developed “tier two” options that, while limited in scope, would serve as mechanisms to carry out the tier one options or to address specific components of the waste stream. Tier two options, many of which have already been implemented at the state level, include advanced disposal fees, tradable recycling credits, container deposit systems, packaging bans, landfill bans, and user fees. See id.

¹³² RECYCLING ADVISORY COUNCIL, Product-Specific Minimum Content Standards, in MARKET STRUCTURE POLICY OPTIONS BRIEFING BOOK 1, 1 (1993) [hereinafter Product-Specific Minimum Content Standards].

¹³³ See id.

¹³⁴ See id.

¹³⁵ Id.

¹³⁶ Id.


¹³⁹ The statute defines a rigid plastic container as "any package composed predominately of plastic resin which has a relatively inflexible finite shape or form with a minimum capacity of eight ounces and a maximum capacity of five gallons that is capable of maintaining its shape
one of three recycling mandates: (1) the containers contain twenty-five percent recycled content by January 1, 1995;\textsuperscript{140} (2) the containers be made of plastic that is recycled in Oregon at a twenty-five percent rate by January 1, 1995;\textsuperscript{141} or (3) the container be a package that is used five or more times for the same or substantially similar use.\textsuperscript{142} The state requires each manufacturer to submit certification reports to the Oregon Department of Environmental Quality to show that the manufacturer is complying with these mandates.\textsuperscript{143}

Wisconsin also requires a percentage of its plastic to be made of recycled plastic, but Wisconsin's legislation is less stringent than the Oregon legislation. Wisconsin mandates that "no person may sell or offer for sale any product in a rigid plastic container unless the container consists of at least ten percent recycled or remanufactured material by weight beginning on January 1, 1995."\textsuperscript{144} The Wisconsin statute has a broader scope than Oregon's in that Wisconsin's statute does not specifically limit the requirement to any minimum-sized container.\textsuperscript{145} The statute, however, does not apply to sellers of food, beverages, or drugs in plastic containers if the federal Food and Drug Administration has not approved the use of specified recycled or remanufactured content in that plastic container.\textsuperscript{146}

California's first minimum recycled content legislation was for plastic trash bags. First, the legislation requires any manufacturer of plastic trash bags of 1.0 mil or greater thickness for sale in-state must ensure that at least ten percent of the plastic is recycled plastic from post-consumer waste.\textsuperscript{147} In addition, by 1995, every plastic bag of .75 mil or greater thickness for sale in-state must be made of thirty percent post-consumer recycled plastic.\textsuperscript{148} California's legislation is slightly different from Oregon's because California's legislation not

\textsuperscript{140} OR. REV. STAT. § 459A.655(1)(a) (1993).
\textsuperscript{141} Id. § 459A.655(1)(b).
\textsuperscript{142} Id. § 459A.655(1)(c). Oregon allowed for exceptions to this rule, including packages used for medication, tamper-resistant packaging, materials associated or produced in-state that are destined for out of state destinations, and—most importantly for waste reduction purposes—an exception for packaging reduced 10% from packaging used for the same product by the same packager five years earlier. Id. § 459A.660(3) (1993).
\textsuperscript{143} Id. § 459A.660(1).
\textsuperscript{144} WIS. STAT. § 100.297(2) (1991–1992).
\textsuperscript{145} See id. §§ 100.297(3), 100.38(1)(c). Oregon's minimum recycled content law for plastics is limited to containers between eight ounces and five gallons in capacity. OR. REV. STAT. §§ 459A.650(9), 459A.655(1) (1993).
\textsuperscript{146} WIS. STAT. § 100.297(3) (1991–1992).
\textsuperscript{147} CAL. PUB. RES. CODE § 42291(a) (Deering 1993).
\textsuperscript{148} Id. § 42291(b).
only imposes the duty to meet the requirements and certify compliance on the manufacturer, but it also imposes a duty on wholesale purchasers to report the name and location of all manufacturers from which the bags are purchased. Enforcement, however, is limited to criminal charges of fraud for false rate reporting by suppliers or manufacturers.

California's newest recycled content legislation for plastics is quite similar to that of Oregon, and even goes farther in certain areas. By January 1, 1995, every rigid plastic container sold or offered for sale in California must meet one of six criteria: (1) be made of twenty-five percent post-consumer material; (2) have a recycling rate of twenty-five percent, including PETE; (3) have a recycling rate of fifty-five percent if its primary material is PETE; (4) have a recycling rate of forty-five percent if it is a product-associated rigid plastic packaging container, or is used in conjunction with a particular generic product line; (5) be reusable or refillable; or (6) be a source-reduced container. Violators of these requirements can be subject to fines of up to $100,000, which would go toward assisting local governments to develop and implement collection and processing systems for plastics recycling.

California allowed for waivers of these requirements in a few circumstances. First, these requirements are waived if less than sixty percent of the single-family homes in the state have curbside collection services, including collection of beverage containers, by January 1, 1994. Second, the requirements are waived if fifty percent of a manufacturer's containers sold or for sale in-state within a calendar year meet subdivision (a) of Section 42310 of the California Public Resources Code, and all the manufacturer's containers will satisfy this subdivision by January 1, 1996.

149 Id. § 42293.
150 Id. § 42294.
151 Id. § 42296.
152 A waiver is granted for this subsection if the containers cannot meet the content requirement and remain in compliance with federal FDA regulations or other state or federal regulations; or if it is technologically infeasible to use containers that meet the requirements of this subsection. Id. § 42330(a).
153 PETE is the same as PET, the clear plastic used for one- and two-liter plastic soft drink bottles.
154 CAL. PUB. RES. CODE § 42310 (Deering 1993).
155 CAL. PUB. RES. CODE § 42322 (Deering 1993).
156 CAL. PUB. RES. CODE § 42330(b)(1) (Deering 1993). This waiver seems to have been added for fairness reasons, as it will be difficult if not impossible to meet these mandates if there is an inadequate supply of plastic available to recyclers.
157 Id. § 42330(b)(2). This waiver probably is intended for the manufacturer who makes a good
The statute also grants exceptions for certain containers. For example, plastic packaging containers destined for shipments outside the state; containers containing drugs, medical devices, food, or infant formula as defined by the Federal Food, Drug and Cosmetic Act;\textsuperscript{158} and containers carrying toxic or hazardous products regulated by the Federal Insecticide, Fungicide, and Rodenticide Act.\textsuperscript{159}

B. Material-Specific Utilization Requirements

Material-specific utilization requirements would impose upon manufacturers, packagers, and other responsible entities the duty to recover and utilize a set percentage of specific material from nondurable products and packaging otherwise destined for a landfill.\textsuperscript{160} The company could recover and reuse the material itself, or could arrange for another company to do so.\textsuperscript{161} The material-specific utilization requirements are more flexible than other proposals in that they could be imposed on a local, state, or national level via statutes, regulations, or cooperative agreements.\textsuperscript{162}

Under material-specific utilization requirements, a government entity would determine, with input from other interested parties, a utilization rate for a specific product.\textsuperscript{163} The rates would be imposed on an industry-wide basis for goods and packaging made from specific materials or on individual companies manufacturing materials made from applicable materials.\textsuperscript{164} Generally, utilization rates are more flexible than minimum content requirements because they allow recov-
ered materials to be used in a range of end uses, thus making it easier for companies to comply with the requirements. One proposal even calls for creating a system of tradeable credits to allow companies that exceed the utilization requirements to sell the credits to companies that do not meet the requirements.

Compliance would be a two-step process. First, if the required rates were not met, the administrating entity could impose more stringent minimum content requirements for these products. If this did not work, the second step would be for the governing entity to impose penalties for noncompliance, including fines, public embarrassment via mandatory labeling of products that did not meet the requirements, and, if necessary, a ban on the sale of such products.

The impact of material-specific utilization rates would increase the demand for recovered materials and reduce the amount of solid waste being put into landfills, thus improving markets for recycled materials. This increase in demand would also encourage companies to ensure that an adequate supply of recovered material was available for them to meet the rate requirements. Virgin material use would decrease, and jobs in those industries would probably be lost, but this would be offset by jobs created in the growth of industries that would facilitate meeting these rates and jobs created in the administration of the program.

C. Manufacturer’s Responsibility

This concept places the responsibility for solid waste management upon the manufacturers of consumer products, rather than on taxpayers via municipal solid waste management. It is based on the premise that taxpayer-funded waste management is inequitable and that only manufacturers and consumers of their products should pay for disposal of those items. This has never been implemented in the

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of the packaging is reused or refilled; or (4) require packaging to be reduced in volume or weight by a set percentage. See id. at 1–2.

165 Id. at 1, 5.
166 Id.
167 See id. at 2.
168 Id. at 2–3.
169 Id. at 1.
169 See id. at 3.
170 See id.
171 See id.
172 See RECYCLING ADVISORY COUNCIL, Manufacturer’s Responsibility, in MARKET STRUCTURE POLICY OPTIONS BRIEFING BOOK 1, 1 (1993).
173 Id.
United States, but some European countries have established such programs in their countries.  

Manufacturer's responsibility legislation would place upon the manufacturer of certain products or packaging the financial burden of solid waste management "commensurate with the amount of each manufacturer's product/packaging in the waste stream." The manufacturers, which would form consortia within their realm of responsibility, would determine the best way to meet their waste management obligations. Choices could include creating their own municipal solid waste management systems, contracting out the management of systems, or funding existing municipal programs.

The expected impacts of manufacturer responsibility legislation would be to reduce the cost of waste disposal in some areas, but it would increase costs in other areas. On the one hand, placing waste disposal responsibility upon manufacturers would free up limited local government fiscal resources for other needy programs, such as education. In addition, the cost of solid waste management would decrease because manufacturers probably would choose the most cost-effective and efficient means of solid waste management. On the other hand, manufacturer responsibility would almost certainly increase the price of consumer products and packaging because the management costs would be passed on to customers. In addition, it is likely this system would increase state or federal government administrative costs because both state and federal governments would have to determine the levels of financial responsibility as well as monitor the health and environmental impacts of the programs. While this system would encourage cost internalization and would minimize de facto government subsidization of the manufacturers for waste disposal costs, the programs would not necessarily help recycling efforts and could actually discourage them.

174 See id. In 1991, Germany decided to hold distribution and retail sectors legally and financially responsible for the recovery and reuse of 80% to 90% of various materials used in packaging, including plastic, by 1995. See id.

175 Id.

176 Id.

177 Id. at 1.

178 See id. at 2–3.

179 Id. at 1.

180 Id.

181 Id.

182 See id. at 1–2.

183 See id. at 2–8.
D. Virgin Materials Tax

A virgin materials tax is exactly what it sounds like: a tax imposed on the virgin material used in the manufacture of products and packaging.\textsuperscript{184} The purposes of imposing a virgin material tax include promoting conservation of natural resources, encouraging the use of recovered material rather than virgin material, and reducing the volume of disposed waste.\textsuperscript{185} Such a tax seeks to “incorporate external disposal costs of major elements in municipal solid waste and [to] provide an incentive to use recovered materials in the manufacturing [of] affected products/packages.”\textsuperscript{186}

A virgin materials tax could be imposed on the virgin content of all materials in durable and nondurable goods—an “extraction tax”—or could be imposed upon manufacturers for the virgin content of specific products or packaging, such as paper or plastic—a product/packaging tax.\textsuperscript{187} Ideally, it would be imposed on a standardized national basis to remove sensitivity to local conditions, although rate adjustments could be used to make the tax more equitable for affected materials.\textsuperscript{188} The tax also could be imposed on the basis of weight, although other bases could be used where fairness called for it.\textsuperscript{189}

The immediate obvious impact of a virgin materials tax would be to increase the price of virgin materials.\textsuperscript{190} This in turn would encourage manufacturers to use less virgin material and more recovered material, and thus, increase the demand for recovered materials.\textsuperscript{191} In addition, the tax could be an effective pollution control measure because it takes less energy to use recovered material in manufacturing than to develop raw materials for the same purpose.\textsuperscript{192}

A virgin materials tax, however, could also have a significant economic impact. An increase in the price of virgin materials resulting from such a tax could adversely impact regions dependent upon virgin

\textsuperscript{184} RECYCLING ADVISORY COUNCIL, Virgin Materials Tax, in MARKET STRUCTURE POLICY OPTIONS BRIEFING BOOK 1, 1 (1993) [hereinafter Virgin Materials Tax].
\textsuperscript{185} Id.
\textsuperscript{186} Id.
\textsuperscript{187} Id.
\textsuperscript{188} Id.
\textsuperscript{189} See id. For example, the tax on plastic containers could be imposed on a per unit basis. See id.
\textsuperscript{190} Id.
\textsuperscript{191} See id.
\textsuperscript{192} See id.; see generally Recycling: Is It Worth the Effort?, supra note 43. To be an effective pollution control device, the tax would have to be extended to imports. See Virgin Materials Tax, supra note 184, at 1. This is especially true for plastic, because the raw materials used in
material processing, and could result in job loss in these areas. On the other hand, there would probably be an opposite effect upon areas with significant recycling processors and manufacturers.

A virgin materials tax would have a beneficial impact on recycling. Demand for recycled products would increase because recycled materials would be less expensive than virgin materials. While this would not directly increase the supply of recovered materials, the supply of recovered materials would be increased indirectly due to an increased demand from manufacturers consuming the less expensive recycled material. The increased demand for recovered material would increase the amount and quality of solid waste. Increased demand would also conserve landfill space by diverting materials from the landfill stream to the recycling process. By the same token, the increased tax revenue could be used to support recycling programs, which would also increase the supply and quality of recovered material. From an economic and environmental standpoint, both municipalities and recyclers would win if a virgin materials tax were imposed.

E. National Secondary Materials Utilization Trust Fund

The creation of a National Secondary Materials Utilization Trust Fund could also increase market demand for recovered materials by promoting the use of secondary materials by domestic industries. The trust would encourage the use of recovered materials by allotting a “materials reutilization rebate” to domestic manufacturers who use recovered materials in their products. The trust would be funded via a “materials use charge” for the raw materials used to package products which would be imposed on every foreign or domestic company that sells or manufactures products in the United States.

products and packaging do not occur naturally but have to be blended and processed before they go into the manufacture of the final product.

194 Id. at 3.
195 Id. at 2.
196 Id.
197 See id. at 2-3.
198 See id.
199 See id.
201 Id.
202 See id.
The fund would work like this: federal legislation establishing the fund would also establish national utilization requirements for specific materials used in packaging. These reutilization rates would be based upon the percentage of recovered material used as a raw material for domestic manufacturing of packaging. The material use fee would be calculated by multiplying a set percentage—based upon the reutilization rate—of the unsupported cost of recycling a certain material times the total amount of that material used in packaging. The material utilization rebate could be determined by multiplying the unsupported recycling costs by the amount of material reutilized. The trust would administer all these calculations and functions, would impose the charges and reward the rebates, and would pursue companies who did not abide by the rules.

Much like the virgin materials tax, the trust fund would increase demand for recovered materials by creating incentives to use recovered materials and disincentives to use virgin materials for manufacturers. The system would also provide an inducement for industry to practice source reduction, thus conserving resources and landfill space. In addition, the trust would increase utilization rates by funding projects to improve the availability of recovered material for manufacturers, thus increasing the utilization rates for the products and packaging they make. Besides these beneficial recycling impacts, the trust would also create administrative jobs to monitor the program and increase manufacturing jobs via encouraging investment in recovered material operations.

F. Shared Responsibility

The shared responsibility proposal puts the burden of recycling on both producers and waste generators. Under the Shared Responsibility Model proposed by the Waste Reduction Advisory Committee...

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203 See id. at 1-2.
204 See id. at 1.
205 Id.
206 Id.
207 See id.
208 Id.
209 Id. at 1-2.
210 See id.
211 See id. at 2-3.
212 Entities that manufacture, distribute, import, and/or use packaging. RECYCLING ADVISORY COUNCIL, Shared Responsibility, in MARKET STRUCTURE POLICY OPTIONS BRIEFING BOOK 1, 1 (1993).
213 Households and industrial, commercial, and institutional facilities. Id.
in Ontario, Canada, producers would be responsible for establishing and funding an organization whose task it is to “construct, own, and/or operate a network of . . . (MRFs) for sorting, processing, and marketing recyclable materials collected from waste generators; and . . . to underwrite the additional costs of collection of recyclable materials, if costs are greater than the cost of collection and disposal of solid waste.”\footnote{Id.} Waste generators would fill their obligation by performing source separation of designated recyclables from the waste stream.\footnote{Id.}

The one major concept of the Shared Responsibility Model is that towns would pay no more for collection of source-separated recyclable materials than for collection of mixed waste, thus capping the towns’ financial responsibility at the cost of collection and disposal of waste.\footnote{Id.} Municipalities would still be responsible for collecting residential recyclables and waste, but the industrial, commercial, and institutional waste and recyclables would be collected by privately funded haulers.\footnote{Id.} In addition, any municipal collection costs that exceeded the normal mixed waste collection and disposal costs would be reimbursed by the producers.\footnote{Id.}

The development and success of this program would require the implementation of backing legislation.\footnote{See id. at 2.} Specifics of the program, such as the materials to be collected, the percentage of the waste stream to be diverted, recycling rates, and system costs, would have to be defined.\footnote{Id.} In addition, there is a need for regulations to enforce compliance with voluntary agreements and specified requirements of the plan.\footnote{Id.}
The major advantage of this plan is its encouragement of private-public partnerships to address the recycling markets problem. In addition, the plan would allow for flexibility in design of recycling programs based upon regional differences in markets and costs. Furthermore, producer financial responsibility for recycling costs would provide incentives for both source reduction and production of easily recyclable products.

VI. PLASTICS RECYCLING IN THE FUTURE

Plastics recycling has reached a make or break point. On one hand, it is fraught with technical and economic difficulties. On the other hand, the technology is improving. As the public becomes more educated and the recycling infrastructure is developed more thoroughly, successful plastics recycling becomes an achievable goal. The realization of that goal is primarily dependent upon the existence of demand for recycled plastic products. The question becomes, then, whether the government should step in to make that goal a reality.

A. An Argument for the Status Quo

There are many—mostly virgin plastic manufacturers—who believe that it would be improper for the government to step into the recycling arena and create legislation to increase demand for recycled plastics. This group is content to let traditional market forces dictate the degree to which plastic is recycled. To those in favor of the status quo of the plastic industry, there is no basis for government

addition, waste generators would be subject to regulations to charge fees and to enforce proper collection and separation of recyclable. See id.

222 See id. at 5–7.
223 See id. at 5–6.
224 Id. at 1. In addition, producer responsibility for marketing would encourage producers to use recovered materials in their products. See id.
225 See supra Section II.B.
226 For example, Union Carbide’s New Jersey recycling plant has developed color-sorting technology that would separate unwanted PVC bottles from batches of desired recovered plastic bottles. See RAYMOND COMMUNICATIONS, supra note 31, at 15.
228 See RECYCLING ADVISORY COUNCIL, supra note 48, at 15; Plastics Recycling Legislation Spreads Around the Globe, supra note 227, at 42 (comments by Mike Hayes of Dow Chemical); Hoffman, supra note 227, at SR18 (comments by Chaz Miller of the Glass Packaging Institute).
intervention into the marketplace to aid an industry that cannot survive on its own if the status of plastics recycling technology is such that end products of the plastics recycling process cannot compete with virgin plastics in the marketplace.229

These groups cite PET as an example of a type of plastic that can be successfully recycled under current market conditions.230 Because recovered PET is easily separable and cleanable, can be processed without problems of contamination and color choice, and competes in price and performance standards with virgin PET, there is no need for government intervention to kick-start the recycling process.231 If adequate separation, process, and performance standard technology existed for other plastics, these plastics also would not require government intervention for successful recycling to occur.232 Thus, status quo proponents believe the government should stay out of the free market.

The status quo argument has merit in the sense that if recycled plastic products were competitive in price and quality with virgin plastics, a discussion of possible governmental intervention in the plastics recycling arena would not be necessary. Factors of price and quality being equal, one would expect products made from recycled plastic to compete well with virgin plastic products because of many consumers’ desire to purchase and use products friendly to the environment. The day that recycled plastic products can compete equally with virgin plastic products in the marketplace has not arrived. It may be coming, however, and that concerns major virgin plastic manufacturers.233

One major variable in the status quo argument is the price of virgin plastics. All plastics contain a significant amount of petroleum or petroleum products,234 so the price for these virgin plastics is dependent in part on the price of petroleum.235 In turn, the competitiveness of recycled plastic products in the marketplace is also dependent upon

230 See supra notes 16-17 and accompanying text.
231 See supra notes 16-17 and accompanying text.
232 See supra Section II.B.
233 See generally Marty Forman, Keynote Address at the Nebraska State Recycling Association Convention (Oct. 20, 1993) (criticizing virgin plastics industry for sabotaging efforts to improve markets for recycled plastic).
235 Malcolm Gladwell, High Cost of Raw Materials Makes Re-use Attractive; Demand For
the price of petroleum. This factor explains some of the lack of demand for recycled plastics in the mid-1980s through the early-1990s, a time when the prices of virgin plastic products were significantly below comparable recycled plastic products due in part to low petroleum prices. By the same token, if petroleum prices were to increase dramatically, such as what occurred during the 1973 OPEC embargo, the petroleum shortage of the mid-1970s through the early-1980s, or an event like the invasion of Kuwait by Iraq in 1990, the demand for recycled plastic products would increase due to their more competitive price. The only remaining issue is the merit of letting collection facilities continue to pile up, and ultimately to landfill, recovered plastic while waiting for such an oil price increase to happen.

While the status quo argument has merits based upon economic theory, it fails to consider the true costs of producing virgin plastic products, specifically waste disposal and resource conservation. If there were a way to take a true cost accounting of the production and disposal of virgin plastic products, recycled plastic products probably would be competitive with virgin plastic products in the marketplace. In that sense, the need for internalization of the true costs of producing virgin plastic products justifies government intervention into the recycled plastics market.

The existing supply-side laws, although underutilized, have been successful in creating a supply of recovered plastics to be recycled. If and when the demand for these recovered materials increases, it would be prudent for government to utilize the bottle bill and curbside collection programs to supply the newly increased demand. As was proven in the late 1980s, however, supply-side legislation alone will not create demand for recycled plastic products. Thus, government should take action to increase demand for recycled plastic products.

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236 See id.

237 See Doug Smock, This Won't be Another 1973, PLASTICS WORLD, Sept. 1990, at 9, 9 (noting opposite proposition that high oil prices led to high plastic prices).

238 See id. (stating belief that affect of Gulf War on plastic prices would not cause increase in plastic prices like that which occurred during 1973 oil embargo); Plastics Are Following the Oil-Price Spiral, BUS. WK., Apr. 7, 1980, at 42D, 42D.

239 See Gladwell, supra note 235.

240 See supra notes 64-66 and accompanying text.

241 See supra Sections III.A.-III.B.

242 See supra notes 83-90 and accompanying text.
B. The Argument for Legislating Demand for Recycled Plastic Products

The movement to increase plastic recycling could be greatly aided by government intervention into the market place. The issue is to what degree should the government step in. Certainly, some demand-side plastic recycling legislation allows for less governmental intrusion into the market place than others. Accordingly, there are both good and bad aspects to these different degrees of government intervention. The task is to analyze these good and bad points and to make intelligent decisions about which types of legislation to utilize, if any.

1. Less Intrusive Legislative Options

Tax incentives, purchasing preference legislation, and ADF programs are less disruptive of the marketplace because they do not impose rigid mandates upon either virgin or recycled plastic manufacturers. As for tax incentives, manufactures can perform cost/benefit analyses upon whether the tax incentives are lucrative enough to justify producing recycled plastic products. Tax incentives, however, do not guarantee that recycled plastic products actually will be used, but only guarantee that more recycled plastic products will be manufactured. Thus, while tax incentives may increase manufacturer demand for recycled plastic products, they may not be the best answer for increasing consumer end use demand for recycled plastic products.

Purchasing preference legislation for recycled plastic products, if implemented, would be a good option if the required purchasing rates were high enough to spur demand for recycled plastics, but low enough to allow government to continue purchasing virgin plastic products as necessary. The downfalls are possible increased costs to government and an economic hit upon virgin plastic manufacturers, which could manifest itself in decreased sales and profits and job losses. These

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243 See supra Section IV.
244 See infra Sections VI.B.1, VI.B.2.
245 See supra notes 91–92 and accompanying text.
246 For example, a manufacturer can decide whether or not it is economically advantageous to change its manufacturing processes to purchase plastics recycling equipment for the purpose of producing recycled plastic products, thus obtaining the tax break. The manufacturer, however, is not required to purchase and use the plastic recycling equipment. See supra notes 91–92 and accompanying text (emphasis added).
247 See supra note 93 and accompanying text.
248 See supra notes 111–17 and accompanying text.
249 See supra notes 112–17 and accompanying text.
increased costs, however, may be justified by the resources conserved and landfill space saved via the use of recycled plastic products. In any case, these options leave manufacturers, virgin and recycled alike, freedom of choice in the marketplace. While purchasing preference legislation would disrupt the marketplace status quo, if suppliers of plastic products being sold to the government wish to continue to do so, they have the choice of changing their manufacturing practices to meet the new requirements. Thus, purchasing preference legislation, if utilized on a nation-wide basis, could have the greatest positive impact on demand for recycled plastic products without greatly disrupting or usurping the market for virgin plastics.

ADF programs, while imposing a fee upon wholesalers of recycled plastic products, also allow manufacturers and distributors a measure of freedom in the marketplace in that they can choose to use recycled plastic in their consumer products if they determine the use of recycled plastic to be most economically beneficial to avoid ADF. If it makes financial sense to do so in light of ADF, manufacturers can increase utilization of recycled plastic in their products. In addition, if manufacturers choose not to use recycled plastic, at least the costs of disposal are internalized upon the manufacturer or distributor rather than externalized upon society. While some critics view ADF programs as a type of tax, at least it is a tax used to directly addresses the problem it is imposed upon—the internalization of disposal costs upon society. Hence, while ADF programs may not necessarily increase production of and demand for recycled products, they would internalize the disposal costs of virgin plastic products, and thus ease the waste disposal burden on society.

One of the least market-intrusive RAG proposals is the Shared Responsibility Model. While the creation of market demand for recycled plastics is not as direct as other legislation, the Shared Responsibility Model puts the bulk of responsibility upon manufacturers to carry out the program. This gives manufacturers freedom to determine the most efficient way of handling and reprocessing recov-
ered plastics. Success of this proposal, however, requires some degree of government intervention, as the Shared Responsibility Model requires backing legislation and government oversight both to determine what materials will be recycled at what rates, and to enforce agreements between manufacturers and municipalities. Thus, the Shared Responsibility Model, while commendable in the flexibility it allows to the players in the system, may not be the best answer.

2. More Intrusive Legislative Options

Other existing legislative options, while potentially effective in spurring demand for recycled plastic products, are controversial because they are more intrusive in the market place. For example, landfill bans would probably be the most effective spur to increase the use of recycled plastic because there would be almost nothing else to do with the recovered plastics than to recycle them. The status of plastics technology and the recycled plastics market, however, are such that unless landfill bans were instituted quite gradually, MRFs would drown in skyscraper-high piles of milk bottles, detergent bottles, and the like. Therefore, landfill bans are neither a fair nor practical option.

Product-specific minimum content requirements, while less market intrusive than landfill bans, nevertheless impose mandates upon manufacturers who wish to sell plastics in a particular market. For example, the closed-loop aspect of the program limits the types of uses for recovered materials in recycled products. In addition, minimum content requirements remove some of the manufacturers' choices of how to compete in the market. Furthermore, there would be increased costs of government supervision and enforcement of the programs.

These requirements, however, are not unreasonable. The rate requirements are relatively low and allow for so many fair-minded

260 See supra notes 221–23 and accompanying text.
261 See supra notes 218–20 and accompanying text.
262 See infra Section VI.B.2.
263 For example, if plastic wastes cannot be deposited in landfills, the remaining options on what to do with the plastic are limited to storing it—which would probably be prohibitively expensive—or reusing it in some way. Thus, landfill bans most certainly would result in increased use of recovered plastic in products. See supra note 125 and accompanying text.
264 See supra Section II.B.
265 See supra Section V.A.
266 See supra notes 134–35 and accompanying text.
267 See supra notes 132–55 and accompanying text.
268 See supra notes 132–55 and accompanying text.
exceptions to the requirements that the impact upon manufacturers would not be as severe as originally expected. Minimum content requirement legislation initially would disrupt the marketplace, but the disruption would be softened by the exceptions to the laws and be relatively short in duration once the market adjusted. Thus, assuming the plastics industry could adapt to market changes, product-specific minimum content requirements are an option worth considering.

Material-specific utilization requirements are similar to minimum content requirements in method and scope, but are more flexible because they allow recovered materials to be used in a wider range of end uses. Implementation of material-specific utilization requirements also would disrupt the plastics marketplace and cause job losses in the virgin plastics industry, but these job losses would be offset by job growth in the recycled plastics industry. Therefore, material-specific utilization requirements may be another option worth considering.

Manufacturer's responsibility legislation is most effective in its internalization of plastic waste disposal costs, but would be fraught with problems that could curb its positive effect on demand for recycled plastic products. Differences in local market conditions would determine the cost effectiveness of the programs, and government oversight of the programs would be more costly than other types of legislation. Thus, there are better legislative options to spur demand for recycled plastic products than manufacturer's responsibility legislation.

A virgin materials tax would increase demand for recycled plastic products, and would internalize waste handling costs if tax revenues were used to cover disposal costs of virgin plastic products. Market-place disruption would be severe, however, and would result in a profoundly negative impact upon the virgin plastic industry. Nevertheless, as demand for virgin plastics would always exist because of the finite processing life cycle of plastic, there will always be a need for virgin plastic manufacturing. Therefore, while a virgin materials

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269 See supra notes 146, 156–59 and accompanying text.
270 See supra notes 146, 156–59 and accompanying text.
271 See supra notes 161–63 and accompanying text.
272 See supra note 171 and accompanying text.
273 See supra notes 178–83 and accompanying text.
274 See supra notes 178, 182 and accompanying text.
275 See supra notes 195–99 and accompanying text.
276 See supra notes 190–94 and accompanying text.
277 See supra notes 38–39 and accompanying text.
tax initially would disrupt the virgin plastic market, it is an option that should be considered because it would increase demand for recycled plastic products without completely usurping the need for virgin plastics.

VII. Conclusion

There is no question that both the existing and proposed legislation set forth above can, and would, improve the demand for recycled plastic products. But the price for improved demand, especially in the areas of severe market disruption and increased government involvement in the recycling process, might be too high under some of the proposals. Many of the proposals, however, including purchasing preference legislation, tax incentives, and Advance Disposal Fees, address the need for improving recycled plastic markets without greatly increasing government involvement in the recycling process or causing major disruptions in the plastics industry. Virgin plastic price fluctuations and plastics recycling technology are unknown variables that can render these proposals completely necessary or superfluous, and that is part of the problem in determining the appropriate method to improve the demand for recycling plastic products. Whatever course is followed, the importance of recycling our plastics is paramount, both for minimizing the volume of our waste stream and for conserving natural resources. Thus, contrary to many who favor the status quo in the plastics industry, the need to improve market demand for recycled plastics products is not just a bunch of garbage.