Policy Analysis

Cato Institute Policy Analysis No. 202: Wasting Resources to Reduce Waste: Recycling in New Jersey

January 26, 1994

Grant W. Schaumburg Jr., Katherine T. Doyle

Grant Schaumburg, Jr., is an investment manager at Mount Lucas Management Corporation in Princeton, New Jersey. Katherine T. Doyle is a recent graduate of the Woodrow Wilson School of Public Policy at Princeton University.

Executive Summary

A growing number of states and cities are enacting recycling laws to encourage or mandate recycling, and the Clinton administration promises to do the same at the federal level. Unfortunately, those measures neither conserve scarce resources nor help to protect the environment. Because New Jersey's household recycling law is one of the most comprehensive in the nation, it is a salutary example of the follies of mandatory recycling.

The quantity of goods recycled as a result of New Jersey's Mandatory Recycling Act amounts to approximately 0.5 million ton per year. The net cost of mandatory recycling (measured by the value of landfill savings and recyclables minus the value of the resources consumed by the recycling effort) is in excess of $35 million per year, yet New Jersey's law results in the recycling, not of 48 percent, as claimed by state officials, but of less than 4 percent of total targeted municipal solid wastes.

The main beneficiaries of the program are government bureaucrats; local governments; and the waste management, public relations, and recycling industries. The losers are the households and commercial establishments that finance recycling through hidden taxes but derive no appreciable environmental benefit.

Introduction

The goal of recycling legislation is to conserve scarce resources--land, energy, labor, and so on--and to prevent wastes from damaging people and the environment. Mandatory recycling laws, however, tend to squander valuable resources, and nowhere is that more clear than in the state many credit with having the most aggressive recycling program in the nation, New Jersey.

This study examines the record of the New Jersey mandatory recycling program: what it costs, what it saves, whom it benefits, and why it has proven so popular with state and municipal officials. The answers are a sober warning to states and the federal government. New Jersey's recycling program has proven to be a misguided effort to manage the consumption of resources, and the legislation that created the present morass has been enacted, expanded, and implemented without an adequate study of benefits and costs.

It is important to remember that certain categories of waste (e.g., auto scrap and corrugated boxes) have long been recycled or reused without government mandate simply because those commodities have been cheaper to reuse than to produce anew. Other materials have not been collected for recycling because there has been no profit in it: it has cost

far more to recycle than to simply manufacture those materials from virgin stock. Mandatory government recycling programs, in effect, ignore the basic economics of the marketplace and require the expenditure of capital to collect commodities for which there is simply no natural demand.

New Jersey's Recycling Regime

The bill that initiated extensive state governmental involvement in recycling, the 1987 New Jersey Statewide Mandatory Source Separation and Recycling Act, made clear that resource planning and management were at the heart of the state's recycling vision. The act was necessary to "decrease the flow of solid waste to sanitary landfill facilities, aid in the conservation and recovery of valuable resources, conserve energy in the manufacturing process, and increase the supply of reusable raw materials for the state's industries."[1] Apparently, none of those objectives could be expected to be met in the marketplace.

The legislation calls for statewide source separation and recycling of solid waste with the goal of recycling a minimum of 25 percent of the total municipal solid waste stream. Materials to be recycled are metal, glass, paper, plastic containers, and food wastes from the residential, commercial, and institutional waste streams.

To meet the 25 percent goal, the regulatory duties and powers of state, county, and municipal governments were all greatly enlarged. On the state level, the legislation established the New Jersey Office of Recycling to oversee a State Recycling Fund, administer a tonnage grant program to municipalities, and coordinate county efforts. Counties were required to adopt district recycling plans that would designate a district recycling coordinator, specify the recyclable materials to be collected, and detail the strategy to be used to collect and market the materials. Finally, the legislation required each municipality to designate a recycling coordinator, update municipal master plans and site plan ordinances to include recycling provisions, adopt source separation ordinances, enforcement procedures to ensure compliance by residents and businesses, and collect recyclables either directly or by contract. All communities are required to recycle leaves and at least three of the following materials: paper, metal, glass, plastic containers, and food waste.

Each of New Jersey's 21 counties is given some flexibility in its application of state mandates. Nine counties require municipalities to collect and market recyclables independently, six offer to market materials collected by the municipalities, and six coordinate both the collection and the marketing of recycled materials. All counties require households to recycle glass, aluminum, and newsprint. Some have also mandated the recycling of plastic beverage containers, all plastic containers, tin food containers, corrugated cardboard, grass clippings, junk mail, or magazines.[2] The commercial sector is required by all counties to recycle office paper and corrugated cardboard as well as the materials designated for household recycling.

To help finance the massive recycling effort, the Mandatory Recycling Act increased the tax on landfilled solid waste almost fourfold (from $0.12 per cubic yard to $1.50 per ton, or approximately $0.45 per cubic yard). The tax currently yields approximately $15 million annually for the State Recycling Fund, which is allocated as follows: 40 percent to municipalities and counties as tonnage grants; 35 percent for low-interest loans and loan guarantees to recycling businesses and industries and for research on collection, market stimulation, reuse techniques, and market stud- ies; 10 percent for a public information and education cam paign; 8 percent for county program grants; and 7 percent for state administrative costs.

Under the tonnage grant program, the Office of Recycling distributes Recycling Fund revenues to municipalities on the basis of the amounts of materials recycled in the previous calendar year. Municipalities receive credit for all recycled postconsumer wastes, even those unrelated to the materials mandated for municipal recycling. For example, recycled demolition wastes, such as asphalt and concrete, and recycled auto scrap can be included in a municipality's application to the tonnage grant program even though recycling them is not mandated and they are not collected under municipal recycling programs. In 1990 tonnage grants of $6.5 million were distributed to 548 municipalities and 6 counties.

The Mandatory Recycling Act also includes provisions that subsidize businesses that engage in recycling. Low-interest recycling loans, ranging from a minimum of $50,000 to a maximum of $500,000 (or higher for certain projects that are deemed necessary by the New Jersey Department of Environmental Protection) are available to qualified

businesses. The maximum term of a loan is 10 years, and the interest is fixed at 3 percent below prime. In 1990, $5.6 million from the Recycling Fund was distributed in eight low-interest loans to recycling businesses.

The law also provides corporations with a tax credit worth 50 percent of the price of newly purchased recycling equipment. A business may use up to 20 percent of the total tax credit in a single year. In 1990 New Jersey granted 290 corporate tax credits worth $15.2 million to the purchasers of recycling equipment.

Funds are also allocated for "market studies" and "market stimulation," since advocates of recycling insist that "no growth is possible in the [recycling] industry unless firms can be assured of a reliable source of materials."[3] Studies of New Jersey markets have enumerated the uses of recyclables and proposed other uses, but actual market development efforts have been meager.

In 1990, $1.6 million from the State Recycling Fund was allocated for public education programs aimed at "changing the habits" of New Jersey residents.[4] Those programs included workshops, seminars, and courses for government officials and school teachers; appearances by a magician, "Mr. R. E. Cycle," who spread the recycling message at schools and children's events; and the commission of an independent public relations agency to design billboards, bus displays, public service announcements, conference exhibits, and magazine advertisements.

New Jersey's Recycling Scorecard

Mandatory recycling requires incentives and regulations to overcome the natural tendency of people to minimize the costs of disposal. A controlled economic activity also requires extensive data, and mandatory recycling is no exception to the rule. Measurement of waste and recycling flows is necessary for enforcing regulations and documenting the efficacy of recycling mandates.

We estimate the amounts recycled under New Jersey's mandatory recycling law, along with the associated costs and benefits. Unfortunately, as an analysis of the New Jersey program demonstrates, even a large, expensive bureaucracy cannot effectively manage or measure well enough to run a mandatory recycling program. Some of the results of mandatory recycling are the intended ones: some wastes are recycled and some land is saved. But the tonnages recycled are actually far less than claimed by recycling officials, and the unintended consequences of mandatory recycling swamp the intended: the costs exceed the benefits by a large amount.

According to the State Office of Recycling, 4.8 million tons of material were recycled in New Jersey in 1990. That represents a 1.3 million ton increase from the previous year's total and equates to 48 percent of the total municipal solid waste stream. However, those figures must be interpreted with caution. Despite a veneer of precision ("4,808,364.5 tons recycled in 1990"), two related problems continually undermine the state's attempts to track recycling totals: measurement and enforcement.

Measurement

New Jersey's mandatory recycling program is plagued by problems in the measurement of waste flows. The information needed for official recycling tallies often is simply not available. As a result, the state is reduced to making stab-in-the-dark estimates. A glaring example is the calculation of the total amount of recycling in 1990. According to the Bureau of Planning in the Department of Solid Waste, New Jersey recycled 6.9 million tons of material in 1990.[5] That figure was derived by adding the 4.8 million tons of recyclables documented under the tonnage grant program to 2.1 million tons of recycled industrial scrap (which is ineligible under the tonnage grant program).[6] Although the figures sound impressive, companies do not report industrial scrap recycled, so the Bureau of Planning can only attempt a very rough estimate of that recycling category.[7] Since the estimate of industrial scrap bolsters the state's tally of total recycling by nearly 50 percent, and since the recycling of scrap occurs without government intervention, the approach provides a highly misleading picture of the recycling program.

Recycling estimates are no better on the municipal waste side of the ledger. According to Scott Weiner, commissioner of the New Jersey Department of Environmental Protection, the department currently accepts three kinds of documentation of recycling for municipal and county tonnage grant applications: (1) the actual weight receipt for matrials from a market (a "market" is a user or processor of recyclables); (2) a letter from the market documenting the

receipt of materials; and (3) a letter from the sponsor (broker or other provider of the materials) documenting the transport of the materials to the market.[8] Thus, a recycling broker, market, and municipality can each get credit for recycling the same ton of material, which can lead to greatly exaggerated recycling totals. The Department of Environmental Protection attempts to minimize double and triple counting by comparing weight receipts and letters. It is unlikely, however, that even a painstaking bureaucratic review of receipts for several million tons of recyclables can produce accurate recycling data. Surely that is a job that would have stumped even the most sophisticated Soviet planner.

Even in a perfect world in which double and triple counting could be eliminated, measurement problems would continue to plague New Jersey recycling because the program depends heavily on the monitoring skills of individual municipalities and counties. Many of those entities are unable to perform the complicated procedures needed to keep track of recycling totals. Lawrence J. Zaayenga, the solid waste coordinator for Monmouth County, commented on that problem in a May 1990 letter to the Department of Environmental Protection. He wrote that "most counties are making honest efforts to carefully track recycling efforts with little specific guidance from the Office of Recycling. There are, as yet, no detailed rules for record keeping."[9] As a result, tonnage grant applications often include ineligible materials or use incorrect accounting units, thereby skewing recycling totals.[10]

Inaccuracies also stem from the fact that the towns and counties have a direct incentive to inflate their recycling totals to maximize their receipt of tonnage grant money. In the letter cited above, Zaayenga questioned the counties' data: "Can it be shown that each [county's] 'total recycling rate' was truly calculated using similar data bases? Are these numbers real or just wishful thinking?" So inflated are the total recycling rate data that Zaayenga sarcastically suggested that his county "should discard an accurate accounting system and develop new estimates."[11]

The problems of measurement are illustrated by comparing two sets of data from different state sources. Table 1 compares waste flow and recycling estimates of the Emergency Solid Waste Task Force (established in 1990 to determine "where, how, and what possibilities exist to initiate a policy of source reduction and achieve greater recycling of New Jersey's solid waste stream")[12] with those of the New Jersey Office of Recycling.[13] The waste categories shown are used by both the task force and the Office of Recycling. The major discrepancies between the two sets of data are testimony to the impossibility of obtaining accurate information on recycling.

Table 1
Discrepancies in Recycling Estimates for 1990 (1,000 tons per year)

Waste Category	Task Force Estimate	Office of Recycling Estimate
Aluminum cans	12	30
Auto scrap	619	184
Corrugated	316	517
Food waste	43	71
Newspaper	389	510
High-grade paper	149	92
Other paper	0	206
Plastic containers	2	10
Other plastics	0	6
Tires	5	25

Sources: Emergency Solid Waste Assessment Task Force, Preliminary Report, July 6, 1990, p. 91. Office of Recycling 1990 tonnage grant program totals provided by Joe Rogers, New Jersey Department of Environmental Protection and Energy, Division of Solid Waste Management, in a telephone interview, June 1992.

Enforcement

Another serious difficulty for those concerned with obtaining accurate estimates of recycling is enforcement of the law. The Mandatory Recycling Act legislated a tax of $1.50 per ton on all landfilled solid waste. To collect that tax, counties must intercept, weigh, and tax waste shipments before they reach the landfill. That policy has proved difficult to enforce, however, because waste haulers can avoid paying the tax by circumventing the measurement points. In one New Jersey county alone, a single waste hauler was charged with more than 1,000 counts of tax evasion during a three-year period.[14]

Based on the tonnage hauled by one truck (16 to 18 tons per day), a waste hauler avoids $24 to $27 per day in recycling fees by doing an end run around the regulatory system. Those costs pale, however, in comparison with the total disposal fees that result from New Jersey's misguided crusade against landfills. Driving directly to the landfill and avoiding the regulatory middlemen can save a hauler $20 to $70 per ton. Given such incentives, it would be surprising if compliance were the rule rather than the exception.

Recycling Attributable to the Law

In Table 2 the state's data from 1980 and 1990 are used to estimate the amount of recycling that has occurred as a result of the Mandatory Recycling Act. The first column gives 1980 and 1990 waste generation in each of the major household recycling categories. The second column gives the 1980 and 1990 recycling tonnage estimates, and the third column shows the 1980 and 1990 recycling percentages (column 2 as a percentage of column 1).

Using those data, we constructed the last column of the table as follows: Since the 1980 amounts were recycled before enactment of the New Jersey recycling legislation, we assumed that the percentage recycled in 1980 was recycled without the added costs and incentives of the legislation. Thus, the difference between the 1980 and the 1990 recycling percentages can arguably, although not necessarily, be attributed to the recycling legislation. We then calculated the recycling potentially attributable to the legislation as follows: the fourth column equals the difference in the 1990 and 1980 recycling percentage times the waste generated in 1990.

Table 2 focuses on the primary municipal solid waste categories targeted by the Mandatory Recycling Act; recycling attributable to the law totals 497 thousand tons per year, an amount that represents less than 4 percent of the total New Jersey municipal solid waste stream.

Table 2
Recycling Totals 1980, 1990 (1,000 tons per year)

Waste Category	Generated	Recycled	Percentage Recycled	Mandatory Law
Aluminum				
1980	64	16	25	
1990	76	17	22	2
Glass				
1980	621	36	6	
1990	425	131	31	106
Newspaper				
1980	434	105	24	
1990	623	389	62	237
Corrugated				
1980	582	132	23	
1990	820	316	39	131
High-grade paper				
1980	80	40	50	
1990	250	149	60	25

Total				497

Sources: State Advisory Committee on Recycling, Recycling in the 1980s, September 1980, p. 11; and Emergency Solid Waste Assessment Task Force, Preliminary Report, July 6, 1990, p. 91.

There are obvious problems with that approach, including the inaccuracy of the underlying data. Nevertheless, our estimates have a least two virtues: First, they are based on the reasonable assumption that the spontaneous recycling observed in 1980 would continue to exist in 1990. Second, the estimates are based on data assembled by the 1980 State Advisory Committee on Recycling and the 1990 Emergency Solid Waste Assessment Task Force; both of those groups had the resources to obtain the best of the state's waste management data.

The lesson is that measurement and enforcement are difficult at best. Recycling officials have strong incentives to exaggerate the success of the recycling program by publishing inflated totals. Waste haulers have strong incentives to circumvent the mandatory recycling program by disposing of recyclables illegally. In spite of those difficulties, mandatory recycling does indeed manage to increase recycling; however, as we show below, the cost of that achievement is high.

Benefits and Costs

To increase recycling by approximately 497,000 tons per year, New Jersey instituted an extravagant system of taxes and subsidies and created a costly and intrusive bureaucracy that is overwhelmed by unsolvable problems of measurement and enforcement. Half a million tons is a lot of waste, but to put it in perspective, a landfill measuring a half mile on each side would accommodate 497,000 tons per year for more than 10 years.

Advocates of recycling usually focus on the amount of recycled wastes and the land savings without considering the complete recycling picture. The belief that the recycled materials and land are somehow sacrosanct and important to "preserve" is a common tenet of the (untenable) philosophy of environmentalists. However, in evaluating mandatory recycling, one cannot merely total the resources the program "conserves" without recognizing that it consumes other resources; it takes labor, capital, and energy to manage, collect, sort, sell, ship, process, remanufacture, and market recyclables. Those resources can be put to productive use if they are not squandered at the altar of recycling.

The primary economic effects of the increased recycling are summarized as benefits in the form of savings on collection and disposal (e.g., reduced landfill use) and the value of recycled materials, and as costs of separation, collection, processing, and production and of administration, public relations, and related items.

A true assessment of mandatory recycling that accounts for all benefits and costs exposes the New Jersey program as folly.

Benefits. New Jersey bureaucrats have not always been indifferent to the economics of recycling. In pressing for the Mandatory Recycling Act, supporters of the legislation were quite vocal about the projected economic benefits of the program. According to their rosy, ex ante estimates, recycling would not only save the state money, it would indeed enrich New Jersey. The 1980 State Advisory Committee on Recycling, for example, claimed that a 25 percent municipal recycling rate "could generate $24 million per year for local jobs, taxes, profits," and allow "communities to decrease waste collection and disposal and increase income by $16 million per year by 1986."[15] Four years later, the Office of Recycling maintained that "at the current market price of $65/ton, the State could earn approximately half a million dollars each year by selling the [high-grade waste] paper it normally discards."[16] Similarly, in 1986 Richard Salkie of the New Jersey Department of Environmental Protection proclaimed that "if 25 percent of waste is recycled, this can save the counties, municipalities, and their residents some $50 million a year."[17]

Those were the predictions. The reality has proven far different. First consider the decreased use of landfills, one of the state's highly touted recycling benefits. The cost of building and operating a modern landfill amounts to $10 to $30 per ton of waste; in many instances, the cost is under $10 per ton.[18] At $10 per ton, the New Jersey program's total savings on landfill resource (497,000 tons per year are recycled) are about $5 million per year; at $30 per ton, the savings are $15 million per year.

The landfill costs to many New Jersey municipalities are dramatically inflated by the government's aversion to landfills. As early as 1982, Jim Florio, New Jersey's current governor, declared war on landfills (and on the consumer). "I think it is fairly, almost axiomatic that the future in solid waste disposal is in more sophisticated resource recovery and that landfilling, hopefully, is only a stopgap approach on our way to resource recovery."[19] Consequently, not-in-my-back-yard has degenerated into not-in-my-state, with the governor leading the charge. Instead of arbitrating landfill siting, New Jersey actively discourages new landfills. The results are predictable: counties and municipalities are forced to find distant and expensive landfills that charge $70 or more per ton. At $70 per ton, a landfill can yield $5 million per acre, a windfall for the landfill owner. Those rates should make the waste management industry delighted with New Jersey's regulatory regime.

Next, consider resource recovery. The resources recovered under New Jersey's recycling can be measured by the amount that processors are willing to pay for recyclables: New Jersey recycling processors pay $0 to $15 per ton for commingled glass, cans, and plastic, but the counties must pay processors an average of $45 per ton to take waste newspaper.[20] And, instead of fetching the predicted $65 per ton, the state's high-grade waste paper now sells for $25 per ton.[21] Based on the amounts of glass, newspaper, and high-grade paper recycled, the net loss attributable to getting rid of recyclables is over $8 million per year.[22]

What happened to the resource savings? In a 1990 public hearing, Wayne D. Defeo of the National Solid Waste Management Association testified that little money can be recouped from the sale of recyclables, and consequently, few of the projected economic benefits materialize. "The comment was made earlier that the prices paid for certain materials can offset the costs of collection and processing. I would submit that that's not accurate; that the prices paid could not possibly offset the costs all by themselves. Having run a recycling program, I can say that the prices, when they were much higher, especially in the paper area, offset about 20 percent of the total costs of an operation."[23]

When mandatory recycling was introduced, few businesses were willing to pay for or even accept the thousands of tons of paper, glass, and metal collected by municipalities and counties. Businesses that formerly had paid for recyclables were so flooded with materials that the price of recyclables plummeted. Desperate to be rid of their recyclables, many municipalities and counties resorted to paying markets to accept their goods.

The dearth of buyers surprised few people outside the recycling bureaucracy. Even before the implementation of mandatory recycling, critics had insisted that the program could not function properly unless more markets were developed. Manu Patel, the director of public works for Cranford, issued the following warning in 1986. "If we experience marketing problems at this time when all of the municipalities are not recycling, can you imagine what problems we'll have when they try to market recycled materials after the statewide mandatory recycling is initiated? "[24]

Four years later, public officials were still lamenting the lack of markets for recyclables. Robert Shinn, a New Jersey assemblyman, remarked in 1990 that "we have a lot of problems with [recycling]. They go back to the market issue. I know that part of the Mandatory Recycling Act had that market study component. I don't know where that all ended up, but I know it didn't materialize the way it was envisioned to materialize."[25] Shinn pointed to the problems of marketing recycled newspaper in particular: by 1990 the newspaper market had collapsed so miserably that communities that had formerly received $30 per ton for newspaper were paying $45 per ton on average just to have manufacturers accept their shipments.[26] Shinn complained that "there isn't any market for newsprint [so] people are trying all sorts of things--to shred it, to inject it into the soil, to use it for animal bedding--but they are all sort of expensive processes, which also need to be subsidized."[27]

The Wall Street Journal confirmed that New Jersey is not alone: "The supply side of America's recycling revolution has been growing at an explosive rate, but the demand side is barely under way. Manufacturers simply aren't geared up to absorb the huge volumes suddenly available."[28] As a result, mandatory recycling programs continue to have problems unloading recyclables, and the hopes of "turning garbage into gold" continue to founder.

Costs. The New Jersey Department of Environmental Protection is so entranced with recycling that it contends, "The cost of recycling does not always need to be less than landfilling or other disposal methods."[29] Even they might be dismayed, however, if they took a close look at the recycling program. Mandatory recycling imposes significant

separation, collection, processing, and production costs.

Estimates of recycling collection costs range from $70 to $300 per ton;[30] for example, a 1991 New Jersey study found that curbside recycling programs cost some cities $200 per ton.[31] Since recycling reduces the tonnage (and cost) of regular waste collection, the net cost is somewhat less, probably ranging from $50 to $150.

The costs of household source separation include the time and effort necessary to separate, rinse, bundle, and put out recyclables. Household costs are not financial flows, but they are nevertheless real resource costs. Those costs are small in comparison with a household's income but large relative to the value of recyclables. If each household spends only 5 to 15 minutes each week on recycling activities, that labor, valued at a conservative $5 to $10 per hour, adds $22 to $130 per year to household recycling costs. Since the average household manages to recycle less than 0.5 ton per year, separation costs add $44 to $260 per ton to the recycling costs.

Table 3
Estimated Benefits and Costs of New Jersey's Recycling Program

	Dollars per Ton			Million Dollars per Year		
	Low	High	Mid	Low	High	Mid
Benefits						
Landfill savings	10	30	25	5	15	13
Recycled materials	20	10	0	10	5	0
Total	10	40	25	5	20	13
Costs						
Separation	44	260	100	22	130	50
Collection	50	150	60	25	75	30
Processing & production	2	20	5	1	10	3
Administrative,etc.	14	24	20	7	12	10
Total	110	454	185	55	227	93
Total benefits						
minus costs	120	414	160	60	207	80

sources. Thus, they are not necessarily true economic benefits or costs. For example, a tax credit provided for recycling equipment is a transfer of funds from taxpayers to the owner of the equipment; the real resource cost, if any, is the added amount that is spent on the recycling equipment over what would have been spent in the absence of the subsidy.

In 1990, $5.6 million in loans and $15.2 million in equipment tax credits were provided recyclers. If we assume that half of recyclers' expenditures were undertaken as a result of the recycling program, the one-year investment in recycling was $10.4 million. Of course, those investments must be depreciated over a period of years. If $10 million is invested each year and depreciated over 10 years, the annual cost is initially $1 million and eventually rises to $10 million.

Administration, public relations, and other programs are also costly. Each of the 21 counties bears the costs of running the recycling program. Mercer County, which boasts the state's most effective recycling program, spends $100,000 to $200,000 per year, or approximately $3 to $7 per ton, to manage its recycling program.[32] Add to that the costs of the state Office of Recycling ($4 million per year)[33] and various municipal expenditures ($2 million to $5 million per year),[34] and we arrive at a conservative estimate of $7 million to $12 million per year.

Per ton and total statewide recycling benefits and costs are summarized in Table 3.[35] The table shows the range of benefits and costs along with a somewhat subjective "mid" or "most probable" estimate. It is apparent from the data that the costs of recycling swamp landfill savings and all other possible resource savings. A best-case estimate reveals

that recycling costs exceed benefits by over $100 per ton. Unfortunately, recycling is far from the economic gold mine the state envisioned; instead of generating benefits, recycling costs New Jersey residents dearly.

The Politics of Recycling

Mandatory recycling wastes resources instead of saving them. Yet recycling is gaining momentum; each year more cities and states enact mandatory recycling measures, and the federal government may soon get into the act. How can we reconcile the growth in the number of recycling participants with the failure of recycling? The answer lies in the distribution and the perception of benefits and costs: Many people profit from mandatory recycling even though the overall costs outweigh the benefits. For example, recycling companies, waste management firms, and public relations companies earn revenues from recycling. Similarly, city, county, and state governments, agencies, and their employees derive income from mandatory recycling. The people who bear the costs of the program do so either willingly because they believe in the program's efficacy, unknowingly because the costs are hidden, or resignedly because the costs are unavoidable.

Table 4
Distribution of Recycling Benefits and Costs ($1,000s per year)

Benefits and Costs	Amount
Mercer County Improvement Authority, Princeton costs	
Collection & other recycling costs(a)	+54
Recycling personnel costs(a)	+4
Total	+58
Princeton Borough	
Rebate of waste collection charges due to recycling(b)	+69
Tonnage grant reward for recycling from state(c)	+9
Payment from county for cans and bottles(d)	+6
Administrative costse	5
Total	+79
National Waste Management, Princeton operations	
Rebate to Princeton of waste collection charges(b)	69
Reduced transfer station fees for waste disposal(f)	+144
Recycling collection revenues from Mercer Countyg	+40
Total	+115
Princeton residents and commercial establishments	
Household recycling separation costsh	60
Waste collection savingsi	+69
Added transfer station fees to cover recycling costsj	58
Added transfer station fees for state Recycling Fundk	23
Total	72
Economic benefits and costs of Princeton recycling	
Landfill savings(l)	+30
Value received for recycled materials(m)	4
Household recycling separation costs(h)	60
Increased collection costs(n)	50

Processing and production costs(o)	20
Administrative costs(p)	10
Total	114

(a)Recycling cost data provided by Christopher Buckley, controller of the Improvement Authority.

(b)Based on Princeton Borough 1991 recycling total of 1,005 tons with National Waste Management rebate of $69 per ton.

(c)Grant to Princeton in 1990 under the tonnage grant program was $9,300.

(d)Mercer County Improvement Authority is paid $12 per ton for commingled recyclables. That money is passed on to municipalities. In 1991 Princeton Borough collected 494 tons of commingled recyclables.

(e)Princeton has a recycling coordinator and an environmental commission. The recycling coordinator has other duties in addition to recycling.

(f)Reduced collection and transfer fee expenses are avoided by not picking up recycled tonnage. Based on recycling total of 1,005 tons, a transfer fee of $93 per ton, and $50 per ton collection costs.

(g)Revenues from the Improvement Authority for collecting Princeton recyclables are based on a $1.17-million county contract with 3.4 percent allocated to Princeton based on its share of the county's recycling tonnage.

(h)Assumes separation costs of five minutes per week at $7.50 per hour, or $60 per ton.

(i)Based on the (questionable) assumption that Princeton Borough passes on the waste collection rebates to Princeton residents.

(j)Represents 3.4 percent of total Improvement Authority recycling costs.

(k)The transfer station fee also includes $1.50 per ton for the state Recycling Fund. The fee applies to all Princeton waste, which totaled 15,303 tons in 1991. National Waste Management passes the additional cost through to Princeton. The Improvement Authority collects the fee and gives it to the state Office of Recycling.

(l)Reduced landfill use for Princeton Borough is $30 multiplied by the total Princeton recycling tonnage of 1,005 tons.

(m)Value received for recycled materials equals $12 for 494 tons of commingled waste minus $20 for 506 tons of newspapers.

(n)Increased collection cost of $50 per ton for 1,005 tons of recyclables.

(o)$20 per ton for 1,005 tons.

(p)Assumes costs of $5,000 for Princeton Borough and 3.4 percent of $150,000 Improvement Authority expenses.

The New Jersey recycling program exemplifies the way misinformed and rent-seeking individuals and institutions perpetuate the recycling mania. How New Jersey's recycling program gained momentum and how it continues to tighten its stranglehold can be illustrated by Princeton, New Jersey. Table 4 presents an analysis of recycling benefits and costs as seen from five different perspectives: Princeton Borough (the governmental entity), Princeton Borough's citizens (the people and businesses of Princeton), the Mercer County Improvement Authority (the entity that operates the county's recycling program), National Waste Management, Inc. (the private waste hauler that collects Princeton's waste and recyclables), and the Princeton economy as a whole. Each of those entities receives benefits from and pays costs of the recycling program. Not all of the benefits and costs represent real resource costs because some are financial transfers that consume no resources. Nevertheless, from the point of view of each entity, the benefits and costs are very real.

The data presented in Table 4 help to explain why the recycling juggernaut rolls on unimpeded: Many people gain from recycling. The winners are the Mercer County Improvement Authority, the Princeton Borough government, and National Waste Management, Inc. The losers are the residents and commercial establishments whose costs exceed the associated benefits. And, from the standpoint of real resource benefits and costs, the economy is a loser.

The Mercer County Improvement Authority is typical of of quasi-governmental regulatory bodies. The costs it incurs are offset by the revenues it extracts from transfer station fees. Since the Improvement Authority and its personnel benefit from a growing budget and authority, they have incentives to promote and expand their role in recycling and waste management. The $58,000 that Princeton recycling adds to their operation helps to justify their existence.

Similarly, Princeton Borough and National Waste Management profit from recycling. In 1991 Princeton Borough received net benefits of around $79,000 as a result of the tonnage grant program and the National Waste Management recycling rebate. And, as Table 4 shows, National Waste Management reaps approximately $115,000 from recycling in Princeton Borough.

From the point of view of a myopic town government and a rent-seeking bureaucracy, recycling looks like it combines doing good with doing well. Princeton Borough takes in revenues while helping the state to save the environment. The problem with that picture is that it ignores the lion's share of the costs of recycling, costs that are imposed on all residents as a result of the increased collection fees. Princeton residents pay around $72,000 per year for the privilege of recycling, and the general economy is an even bigger loser. But because many of the direct costs are hidden and diffuse, there is very little political resistance to recycling.

Conclusion

"Waste not, want not" is a time-honored maxim that carries the blessing of every right-thinking environmentalist and economist. By its very nature, recycling seems to fit the bill--instead of wasting old newspapers, why not use them to produce new paper or as bedding materials for farm animals? Recycling is not a new idea; people have always reused resources when it has made sense, that is, when the value of the recyclables has exceeded the costs of recycling.

But why recycle if the costs of doing so exceed the benefits? New Jersey recycling is intended to save resourcs and reduce landfill requirements. The net effect is just the opposite: the Mandatory Recycling Act wastes million of dollars each year. What has gone wrong?

The simple answer is that the free market incorporates all benefits and costs in the price mechanism because all costs and benefits are translated into monetary values.[36] That is why the marketplace is so much more efficient than centrally planned economic undertakings. By simply examining the relative costs of recycling versus, for example, landfilling, we can quickly and effortlessly determine which disposal alternative costs society (in all manners) less. Similarly, by examining the cost of recycled plastic in comparison with that of virgin plastic, we can easily tell which material uses more resources and which uses less.

The state grossly overestimated the benefits and underestimated the costs of recycling because it ignored the information broadcast via the pricing mechanism. There are also two practical problems: the lack of markets for recyclables and the political motives of many bureaucrats and advocates of recycling.

New Jersey foresaw the lack of markets as a potential stumbling block to recycling. Consequently, the Mandatory Recycling Act provided for market studies and market development. Local officials requested that "the state first create a market for recycled materials and then mandate the recycling of materials."[37] But even if markets are "created," their creation requires subsidies and misallocation of resources. The unfortunate and inevitable effect is to reduce consumption and wealth while moving toward a controlled economy.

Nevertheless, in complete disregard of the inevitable waste of resources, politicians, bureaucrats, and supporters of recycling press for more stringent recycling measures and for source reduction. The aim of politicians is to pursue the popular without regard to the costs; the aim of bureaucrats is to keep their jobs and build their public-sector empires; and the aim of environmentalists (latter-day Puritans) is to make all goods recyclable and to reduce consumption.

Debate on recycling is effectively foreclosed by politicians, bureaucrats, and environmentalists who insist on recycling without looking at the facts. They pack agencies and commissions, such as the Emergency Solid Waste Assessment Task Force, with advocates of recycling and recycling bureaucrats who have a private agenda to support recycling.[38] In our enquiries to the state and the counties, we discovered no document that objectively analyzes the benefits and costs of New Jersey's Mandatory Recycling Act. We did, however, often encounter defensive statements: "I don't want to lose my job. This better not show up in a newspaper. My job is not supported by taxes; I don't need to provide you with information."[39]

Mandatory recycling creates waste and destroys wealth without solving any "problems." It is the equivalent of Soviet planning: the state first micromanages an economic activity and then builds an elaborate system of controls and subsidies to sustain it. Resources are wasted to generate recyclables, and then resources are wasted to encourage their use.

We are clearly not running out of places to put our trash. Anyone who has flown into Newark airport recognizes that there is plenty of land available even in New Jersey, the most densely populated state. For perspective, consider the fact that, at current generation rates, all the trash generated over the next 1,000 years could fit into a landfill less than 30 square miles in size (and half that again with advanced trash compaction technology).[40] Finding land for a landfill is a political problem--no one wants a dump in his back yard and garbage trucks rumbling through his neighborhood. But in fact, landfills could be sited if the state would encourage instead of disrupt the process.[41]

Recycling does not necessarily provide for safer or more environmentally sound disposal than does landfilling or incineration. The recycling process itself generates enormous amounts of hazardous waste. For example, de-inking 100 tons of old newspaper for subsequent reuse generates 40 tons of toxic waste.[42] Thirteen of the 50 worst sites on the Superfund National Priority List are recycling facilities.[43]

The New Jersey government has long had a heavy hand in solid waste management. Deregulation of waste management would save the millions of dollars now wasted on uneconomic separation, collection, and administration. If New Jersey would merely allow waste collection firms to collect wastes and recyclables at market prices, those people and firms for whom recycling makes economic sense would recycle. As it stands now, the government not only mandates recycling when it makes no economic sense but also represses the economic forces that give rise to recycling when it pays. In its nearly religious crusade to recycle to save resources, New Jersey is recklessly wasting resources without so much as a thought. Congress and the nation should take heed.

Notes

[1] An Act Concerning Mandatory Statewide Source Separation and Recycling of Solid Waste, New Jersey Public Law 1987, chap. 102, sec. 1.

[2] Telephone interview with Dee Houghton, New Jersey De partment of Environmental Protection and Energy, Division of Solid Waste Management, June 1992.

[3] Mary T. Sheil and Althea Spang, "Recycling Update: An Update on Eighteen Months of Mandatory Recycling," New Jer sey Municipalities, October 1988, p. 2.

[4] New Jersey Department of Environmental Protection, Divi sion of Solid Waste Management, Office of Recycling, Recy cling into the 1990's, Report to the governor and the legis lature, April 1990, p. 1.

[5] Telephone interview with Ray Warob, Bureau of Planning, Department of Solid Waste, June 1992.

[6] Telephone interview with Joe Rogers, New Jersey Depart ment of Environmental Protection and Energy, Contract Admin istration and Finance, June 1992.

[7] Telephone interview with Warob, June 1992.

[8] Scott Weiner, Solid Waste Policy Guidelines in Response to Governor Florio's Emergency Solid Waste Assessment

Task Force: Final Report and Recommendations, June 1991, p. 7.

[9] Lawrence J. Zaayenga, letter to John Czapor, director, NJDEP Division of Solid Waste Management, May 15, 1990, in Recycling in New Jersey: Progress Report on the Recycling of Aluminum, Glass, Plastics, and Newspapers, Public hearing before the New Jersey Department of Natural Resources, May 10, 1990, p. 14X.

[10] Telephone interview with Rogers. Rogers related that 15 to 20 percent of recycling tonnages are disallowed because municipalities either mistakenly report their poundage total rather than their tonnage total or report materials such as industrial scrap, which are ineligible under the tonnage grant program.

[11] Zaayenga, pp. 14X_15X.

[12] Emergency Solid Waste Assessment Task Force, Preliminary Report: Governor's Executive Order no. 8, July 6, 1990.

[13] Ibid., p. 91; and telephone interview with Rogers.

[14] Mercer County Improvement Authority, Quarterly Project Status Report, October 1, 1991, p. 5.

[15] New Jersey Departments of Environmental Protection and Energy, Recycling in the 1980's: Progress Report and Recom mendations, October 1984, p. 4. The following assumption used in this report bears testimony to the impossibility of economic planning and demonstrates the ineptitude of govern ment planners. "The price per barrel of crude oil [is pre dicted] to be $57.07 in 1985 and $101.75 by 1990" (the price of oil in 1992 was approximately $21 per barrel).

[16] New Jersey Departments of Environmental Protection and Energy, Recycling in the 1980's, p.2.

[17] Richard Salkie, Department of Environmental Protection, in Public hearing before the Senate Energy and Environment Committee on S1478, Hackensack, New Jersey, February 13, 1986, p. 4.

[18] Clark Wiseman, "Government and Recycling: Are We Promoting Waste?" Cato Journal 12 no. 2 (Fall 1992): 447-48; JeffBailey, "Economics of Trash Shift as Cities Learn Dumps Aren't So Full," Wall Street Journal, June 2, 1992, p. A1; New Jersey Departments of Environmental Protection and Energy, Recycling in the 1980's, p. 23; and Office of Technology Assessment, Facing America's Trash: What Next for Municipal Solid Waste Management? OTA-0-424 (Washington: Government Printing Office, October 1989), p. 62.

[19] Joint Hearing, 97th Cong., 2d sess., April 16, 1982.

[20] Jim Lambert, Mercer County Improvement Authority director of operations, as quoted by Doug Messier, "County Inun dated in Recycling Success," Princeton Packet, April 24, 1990, p. 5A.

[21] Telephone interview with Dee Hollin, New Jersey Governor's Office, June 10, 1992.

[22] Fifteen dollars for 106,000 tons of glass, $25 for 25,000 tons of high-grade paper, minus $45 for 237,000 tons of newspapers.

[23] Recycling in New Jersey, p. 131.

[24] Public Hearing before the Senate Energy and Environment Committee on S1478, Trenton, New Jersey, April 15, 1986, p. 110.

[25] Recycling in New Jersey, p. 14.

[26] Mark Newhouse of the Newark Star Ledger as quoted in Recycling in New Jersey, p. 22; and Lambert, p. 5A.

[27] Recycling in New Jersey, p. 22.

[28] Frank Edward Allen, "As Recycling Surges, Market for Materials Is Slow to Develop," Wall Street Journal, January 17, 1992, p. A1.

[29] Weiner, p. 18.

[30] "RECYCLINGHow to Throw Things Away," The Economist, April 13, 1991, p. 17; and Clark Wiseman, "Dumping: Less Wasteful Than Recycling," Wall Street Journal, July 18, 1991, p. A10.

[31] Allen, p. A1.

[32] Estimate based on budget of Mercer County Improvement Authority and information provided by Christopher Buckley, controller.

[33] The State Recycling Fund ($16.2 million in 1991) is used to support the Office of Recycling. Seven percent of the fund is allocated to administrative costs; 10 percent to public relations; and 35 percent to loans, guarantees, market studies, and so on. All of the 7 percent, all of the 10 percent, and a portion of the 35 percent represent real resource costs. Some of the 35 percent is included in our estimated processing and production costs. We include 10 percent in our estimate of program costs: Costs = (7% + 10% + 10%) of $16.2 million.

[34] Municipalities typically devote a parttime person to recycling. Based on a cost of $5,000 per year and recycling of 1,000 tons per year, a community like Princeton Borough spends approximately $5 per ton on recycling.

[35] The estimated benefits and costs of New Jersey's recycling program shown in Table 3 were calculated first on a per ton basis and then multiplied by the total amount of postconsumer material recycled under the program--497,000 tons a year. Of course, New Jersey maintains that its recycling law is actually responsible for recycling three times that amount, but that claim is extremely dubious at best. If it were true, however, New Jersey would actually be wast ing three times as many resources as we estimate in this study.

Actual landfill disposal costs are $10 to $30 per ton nationwide. New Jersey is toward the high end, thus our "mid" estimate is $25 per ton. Of course, New Jersey municipalities typically are faced with landfill disposal costs of $70 to $125 per ton, but most of that cost reflects rou tine collection and transportation costs, various state and local taxes, the artificially created shortage of landfill space in New Jersey, and transportation costs for out-of- state disposal. Thus, when calculating the value of actual resources saved by recycling (in this case, the value of landfill space), those factors are ignored.

The aggregate value of recovered materials in New Jersey ranges from $25 to $45 per ton. It could cost as much as $20 per ton on average to induce recycling ("market stim ulation"). A high estimate of possible resource value is $10 per ton, but the best estimate is that the aggregate value of postconsumer recyclable material is zero.

Household separation costs are based on estimates of the time and labor involved in separating recyclables.

Although estimates of recycling program collection costs range from $70 to $300 per ton, our collection estimates are net figures that reflect the avoided costs of the regular waste collection program.

Estimates of the added costs of processing recyclable materials are based on the subsidies provided to recycling firms.

Estimates of administrative costs are based on the amount spent by the state Office of Recycling and the Mercer County Improvement Authority.

[36] While it is true that some costs, such as those of envi ronmental damage, are not fully accounted for in prices, they are roughly reflected in the price mechanism, given that the costs of environmental regulatory compliance are part of final consumer prices. For a full discussion of how environmental costs can be more reflected in prices, see generally Cato Journal 2, no. 1 (Spring 1982).

[37] Public Hearing before the Senate Energy and Environment Committee on S1478, p. 110.

[38] The task force was composed of 15 members--8 from gov ernmental and regulatory entities, 3 from environmental advocacy groups, 1 each from the League of Women Voters and the American Lung Association, and 2 attorneys.

[39] We also encountered helpful and informed county and state employees such as Joe Rogers of the New Jersey Depart ment of Environmental Protection and Christopher Buckley of the Mercer County Improvement Authority, who read a draft of the paper and provided improvement authority cost data.

[40] Clark Wiseman, "Government and Recycling: Are We Promot ing Waste?" Cato Journal 12, no. 2 (Fall 1992): 445.

[41] For several market-oriented alternatives to facilitate landfill citing, see Rodney Fort and Lynn Scarlett, "Too Little Too Late? Host-Community Benefits and Siting Solid Waste Facilities," Reason Foundation, April 1993; and Her bert Inhaber, "Yard Sale," New York Academy of Sciences, The Sciences, January-February 1992, pp. 16-21.

[42] "Paper Chase," Information Please Almanac, 1992, re printed from "Conservation 90," in National Wildlife Feder ation, The Environmental Digest for the Resource Conserva tion Alliance (New York: Houghton Mifflin, 1991), p. 576.

[43] "Recycling Fouls America," National Environment Digest, September 17, 1991, p. 3.