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Is Old News Good News? Increasing the Recycled Fiber Content of Newsprint

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Abstract

As disposal of solid waste became increasingly expensive and problematic in recent years, many governmental jurisdictions mandated the separation and collection of old newspapers (ONP) to remove them from the waste stream. This sudden increase in ONP supply resulted in a price drop that threatened the survival of many programs.

In an attempt to increase ONP demand, laws were proposed, and in some cases passed, requiring newspapers to publish on recycled newsprint. In order to stave off what they saw as a threat to a free press, newspaper publishers, along with the newsprint industry, acted to increase the supply of and demand for recycled newsprint, as well as to increase the quantity and quality of collected newspapers. The market has been moved toward a new equilibrium with a much higher recycling rate. Although it is possible that this equilibrium would have been reached at a later date without government intervention, it seems unlikely.

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Introduction

In a relatively short time, solid waste disposal has gone from a non-controversial, rather mundane task handled unseen (although often not unheard) in the wee hours of the morning, to a topic debated on the floor of the Senate and House of Representatives and displayed on the cover of *Time* magazine.

The United States produces a prodigious amount of municipal solid waste.¹ In 1988, best estimates put generation at 179.6 million tons, of which 72.7 percent was landfilled and 14.2 percent was incinerated. Only 13.1 percent was recovered (removed from the waste stream for the purpose of recycling or composting).²

Over the last decade, the "NIMBY" (Not In My Back Yard) syndrome effectively prevented the siting of new landfills or incinerators. As a result, existing capacity became more valuable. Disposal costs skyrocketed, as municipalities running out of landfill space were forced to ship their waste to distant disposal sites, often out of state. Tipping fees, the amount charged for final disposal of waste, increased dramatically. As a result, it became prudent to reduce the waste stream.

There are two general approaches to reducing disposed waste: generate less, and recover more. Although some attention has been paid to the former, most governmental action has been directed toward the latter. This has come primarily in attempts to increase the separation of certain recyclable materials (e.g. aluminum, steel, glass, newspapers, and some plastics) from the waste stream so they can be recycled, rather than consume scarce and expensive landfills.

Newspapers are generally the first material singled out for mandatory separation. They are the largest component of the household waste stream,³ so removing them has an immediate impact. Until the late 1980s, communities were able to sell their newspapers for a price that allowed recycling programs to show a profit.

As more mandatory programs came on line, however, the market became glutted, and the price of old newspaper (ONP) dropped to zero or below in many communities.⁴ In several communities, the cost of recycling ONP exceeded that of landfilling it.⁵ As a result some programs were canceled or postponed, and some separated newspapers ended up landfilled or incinerated.⁶

Mandated increases in the supply of ONP overwhelmed market demand and price fell. Since newspapers serve as the anchor for most municipal recycling programs, many felt it was important to keep collecting them. Canceling programs that had just started would be seen as giving up on a long, hard-fought battle for responsible waste management. Lawmakers had a choice. They could either cancel the programs, or attempt to stimulate demand for ONP.

The primary end-uses for ONP are newsprint, recycled paperboard (e.g. cereal boxes), tissues and towels, and construction paper and board.⁷ In addition, a significant amount of ONP is exported,⁸ primarily to newsprint manufacturers in southeast Asia. Pressure was put on all end-users to consume more used paper.

Mandating the recycled content of newsprint used in newspapers, however, seemed the most promising candidate for increasing demand for ONP. There is potential for significant expansion of the use of ONP in newsprint production. Newspapers are viewed as high profile, community businesses, and newspapers themselves have been vocal on solid waste issues on their editorial pages. In addition, there is an undeniable elegance in using old newspapers to make new ones.

As a result, over the past two years eighteen states and two localities have enacted legislation or formal agreements controlling the recycled content of newsprint used by newspapers sold within their jurisdiction.⁹ Fourteen of these were enacted in the last year. That is, having disturbed the market by mandating supply, regulators now wanted to correct the market by mandating demand. This entry of government into the workings of the press illustrates the direness of the solid waste problem in the United States.

Background

In 1988, the United States consumed 13.6 million tons of newsprint.¹⁰ Of this amount 75 percent was used by newspapers.¹¹ The United States and Canada (referred to by the industry as North America) form a unitary market for newsprint production. In 1988, 1.4 million tons of ONP from the United States were used to produce the 16.9 million tons of newsprint manufactured in North America. 8.8 million tons of ONP were landfilled or incinerated, 2.3 million tons were used for other domestic paper-making uses, and 1.1 million tons were exported.

Newsprint is made from wood fibers, which come from pulp trees (virgin fiber) or from waste paper (secondary fiber). Of the 73 newsprint mills in North America, all but nine use only virgin fiber.¹² Not surprisingly, newsprint mills tend to be located near pulpwood forests. Mills producing recycled newsprint are located nearer the "urban forest" where ONP is produced.

The manufacture of recycled newsprint differs from that of virgin newsprint primarily in how the pulp is made. Virgin pulp is made by grinding and heating pulpwood, while ONP is turned into pulp by a process known as "de-inking," in which the ONP is pulverized in water, and the ink removed by a washing process.¹³

The length and strength of the pulp fibers determine its suitability for making newsprint. Fiber properties deteriorate upon reuse, and the de-inking process rinses out the reject fibers. About 250 pounds of waste solids

are produced for each ton of ONP de-inked, assuming the ONP was made from virgin pulp.¹⁴

As ONP is repeatedly recycled, fiber quality deteriorates to where recovering the usable fiber is no longer economically viable. Most experts agree that 40–50 percent recycled content is the maximum for a repeatedly recyclable ONP stream.¹⁵ That is, at least half of the fiber to make newsprint must come from either virgin pulp, or from ONP that contains new, never recycled fiber.¹⁶ Thus, in a steady-state system, almost half of the fiber recovered from ONP must end up somewhere other than as new newsprint. Some of the rejected fiber may be used to produce other pulp products, such as egg cartons or packing materials, which can use lower-quality fibers. The rest must be handled by other means, such as landfilling, waste water treatment facilities, or perhaps by enzymatic conversion into alcohol.

U.S. consumption of recycled newsprint is increasing rapidly. In March 1990, approximately 1.9 million tons, or 14 percent of the total newsprint consumption in the United States, contained secondary fiber.¹⁷ North American recycled newsprint production totaled about 2.1 million tons, consuming 1.6 million tons of ONP.¹⁸ As these numbers indicate, the recycled newsprint currently in production contains more than the sustainable 40-50 percent recycled content. Five of the nine de-inked newsprint mills produce newsprint made with 100 percent recycled fiber, while the remaining four produce newsprint with 50 percent recycled content¹⁹.

There is general agreement that the quality of recycled newsprint is on par with virgin newsprint.²⁰ Its runability and printability are essentially the same. As the market for recycled newsprint has expanded, technological improvements have been made to what was once an inferior product. In addition, the price is essentially the same.²¹

The Motivation for Mandating Increased Use of Recycled Newsprint
Believers in the omniscience of the market's invisible hand would argue that the proper amount of recycling is already being done. The incentives of price and cost work to assure that the optimal amount of ONP is used in producing newsprint. The problems, however, lie beyond the reach of the magic hand. Walter Spofford, a researcher at Resources for the Future, states in an article concerning the use of ONP in the production of newsprint:

“...because of residual handling and disposal costs, and the associated external damages, the optimal reuse ratio for the private market will generally be less than the social optimum—unless, of course, all costs are internalized, in which case they will be the same. Public incentives, in the form of subsidies, charges, taxes, or regulation, will be required to encourage the outcome of the

private market to conform more closely with the socially optimal levels of reuse."²²

Making paper is not clean. Significant amounts of SO₂, NO_x, CO, and dust are released into the atmosphere, and the water is similarly deteriorated. It is estimated that 8,000 to 12,000 gallons of water are needed to process one ton of newspaper into newsprint.²³ As is generally the case with industrial pollution, the impact of these emissions on the environment is not borne directly by the polluter.

Similarly, the cost that paper manufacturers face to cut down trees does not cover the costs to society as a whole. For private forests, external impacts such as downstream flooding (due to increased runoff), loss of wildlife habitat, and degraded vistas are not faced by the landowner. In public forests, the price charged for cutting trees often does not even equal the direct costs of the Forest Service.

From a solid waste standpoint, the manufacturer of paper does not face the cost of its disposal. The costs of municipal solid waste service in general have little relationship to the original producer of the product disposed (the major exception being beverage containers in "bottle bill" states). Paper manufacturers pay nothing to dispose of their products, which made up 40 percent of the U.S. waste stream in 1988.²⁴

Recycled newsprint has a clear energy advantage over that made from virgin pulp. Manufacturing 100 percent recycled newsprint uses 75 percent of the energy needed when making it from pulpwood.²⁵ This is because it is easier to turn ONP into pulp than it is to grind up logs.²⁶ Over five times more energy is needed to make pulp from pulpwood than from ONP (2160 vs. 390 kilowatt hours per ton).²⁷ Valuing this energy difference at \$0.06 per kWh, the average cost of electricity in the United States, this makes a difference of just over one hundred dollars per ton, about sixteen percent of the final selling cost of newsprint.

The cost of the solid waste externality has been behind the recent spate of legislative activity related to newspapers. Will Ferretti, director of the New York State Office of Recycling Market Development, noted in a recent speech that "[t]he solid waste crisis now being faced by many communities and states around the country is the result of a market system that does not account for the costs associated with products once they have been discarded."²⁸

Ideally, a benevolent economist-king would make the cost of disposing a newspaper related to the purchase decision, perhaps by charging the consumer a disposal tax upon purchase, or by charging each consumer for tossing out his or her newspaper. Unfortunately, the political obstacles to either of these methods are many. Voters do not want to pay any new

charges, and taxes on newspapers would probably violate the First Amendment of the United States Constitution.

Other economically preferred policies, such as a tax and credit system for virgin and recycled newsprint, are felt to be ineffective.²⁹ Note, for example, that both the *New York Times* and the *Wall Street Journal*, among others, are printed in New Jersey. A New York state or city tax on newsprint would have no effect on these papers, which nonetheless contribute to New York's solid waste problem.

A policy must not be judged solely for its economic impact, but also for its cost of administration. Monitoring mandated usage of certain fiber percentages for newspaper production is more easily done than administering a disposal tax system. A system where "someone else is to blame" for the solid waste problem is more easily sold to the public. Although economics would certainly argue for a system designed to "get the prices right," the realities of politics resulted in the mandated quota system. Although such a system is onerous to a free press, and ill-advised from an economist's perspective, the threat of its implementation has resulted in the creation of an expanded recycled newsprint market, as we will see below.

The Newspaper Industry's Response to Regulation

Responding to political and legislative pressure, major news organizations have asked their suppliers to provide them with increased amounts of recycled newsprint. The American Newspaper Publishers Association (ANPA), which represents over 90 percent of United States newspaper circulation, has encouraged its member papers to support local recycling efforts and to use recycled newsprint to the maximum extent possible.

ANPA has also strongly opposed mandatory fiber content quotas.³⁰ The newspaper industry is vehemently opposed to any legislation that controls its activities. Many see recycled newsprint requirements as the first step towards government regulation of the press. As a result, the industry would prefer to defuse the rush towards legislation by being "good citizens," and satisfying governmental concern voluntarily.

Newspapers are also turning to recycled newsprint to satisfy their customers. Environmentally conscious readers want to feel that they are using a "clean" source of information. A recent article in a newspaper industry publication³¹ cited anecdotal evidence indicating some potential readers have stopped purchasing newspapers because they were either not made of recycled newsprint, or were difficult to recycle because their community did not have a curbside ONP recycling program.

The standard regulatory device for increasing the recycled content of newsprint has been to define newsprint with a minimum secondary fiber content as "recycled," and then mandate that a specified percentage of

newsprint used by publishers (escalating over time) be “recycled.” Forty percent secondary fiber, an EPA definition,³² has been the default standard. There are a number of economic objections to this approach.

The purpose of the legislation is to encourage the maximum feasible use of recycled fiber in the production of newsprint. The minimum fiber content approach denies any value to a manufacturer moving from zero percent recycled content to, say, 25 percent. It may well be the case that for a given manufacturer, it is economical to add less than the minimum standard.

On the other hand, designating a minimum standard does not encourage exceeding that minimum. A manufacturer would receive no advantage for producing 100 percent recycled newsprint.

The newspaper industry favors voluntary agreements that encourage the recycling newsprint industry. A December 1989 agreement in New York state³³ is held up as a model.³⁴ The main points are as follows:³⁵

- **increase the demand for recycled newsprint:** New York publishers agree to adopt recycled newsprint purchasing goals that will raise their consumption of recycled fiber from the current 7 percent to 40 percent by the year 2000.
- **increase the availability of recycled newsprint:** Publishers will encourage their suppliers to make investments in recycled newsprint production, and the state will take steps to attract a recycled newsprint mill.
- **establish New York as a reliable source of quality ONP:** The state will assist communities in developing collection programs that will provide an ONP supply that meets manufacturers’ specifications.

This approach has several advantages over simply mandating percentages. It responds to both demand and supply concerns. By using percentage of recycled fiber (on an annual basis, industry-wide) as the measure of demand, the industry has acted to ensure that the fiber will be used in the most efficient manner. Both publishers and manufacturers are given maximum flexibility. This provides an incentive for all manufacturers and publishers to integrate some recycled fibers into their operations. It also encourages intra- and inter-industry cooperation.

The second point of the agreement has two parts, both of which are intended to encourage investment in the recycled newsprint industry. By assuring recycled newsprint manufacturers a market for their output, the agreement encourages them to make the large investment necessary to expand production. This is especially important in helping to raise capital,

particularly given the excess capacity in the newsprint industry as a whole.

Attracting a recycled newsprint mill to New York state, the second part of the goal³⁶, serves to ensure both a local demand for ONP and a local supply of recycled newsprint. Casting efforts to attract a mill in the framework of the larger agreement assures a potential newsprint manufacturer that there will be a market for the product.

The final point of the agreement, working to ensure the quality of ONP generated in New York state, is also essential to the agreement's success. A steady supply of high-quality ONP is required to produce recycled newsprint acceptable to the publishing industry.

The Newsprint Industry's Reaction

Newsprint manufacturing is a capital intensive business. Capacity is added in big, expensive chunks. A new mill costs about \$500 million to build.³⁷ As a result, the newsprint business is cyclical.³⁸ As production approaches capacity, manufacturers add capacity, creating surplus capacity. The newsprint industry recently entered such a period of excess capacity.³⁹ Demand is flat.⁴⁰ The soft market has led manufacturers to lower prices to keep production high, thereby reducing their earnings.⁴¹

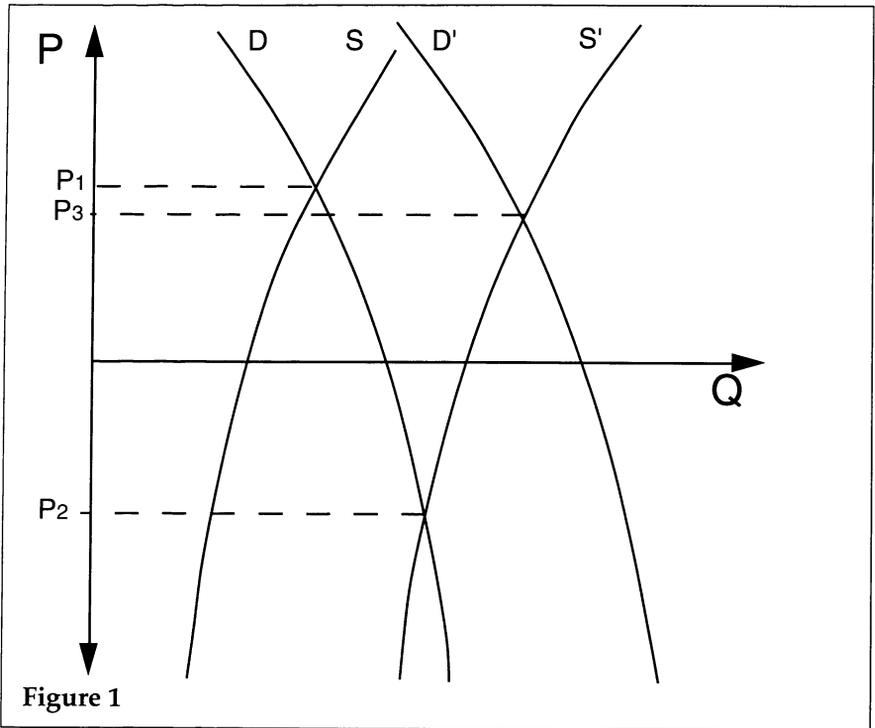
At the same time, however, demand for recycled newsprint has increased dramatically, and recycling mills are operating at full capacity. Newsprint manufacturers are finding it necessary to add new capacity at a time when their earnings are low and demand as a whole is weak.

The manufacturers have little choice. Failure to invest in recycled newsprint capacity would mean loss of business.⁴² As a result, the last year has seen a remarkable commitment by industry to build sixteen recycled newsprint projects over the next two years. This will almost triple current capacity from 2.2 million tons to 6.3 million tons.⁴³

Most of this capacity is being created by adding ONP de-inking facilities to existing mills originally designed to handle pulpwood. Such retrofitting is far less expensive than building an entirely new mill, averaging about \$225,000 per daily ton⁴⁴ of throughput, or about \$60,000,000 for a typical 275 ton per day operation.

As noted earlier, most newsprint mills are closer to sources of pulpwood than to ONP. To meet their need for ONP, many mills will have to transport paper long distances. This is particularly true for Canadian mills. These mills are expected to take advantage of empty train cars heading back to Canada after shipping goods to the US—so-called "backhauling."⁴⁵ Nonetheless, it is still less expensive to bear this additional transport cost than it is to build a new mill nearer to the "urban forest," or to lose sales and market share by failing to meet demand for recycled newsprint.

Investment in new recycling capability has come about for several reasons. The newspaper industry's embracing of recycled newsprint has



guaranteed demand for the product. In addition, the glut of ONP caused by mandatory recycling programs has brought the price of making newsprint from ONP too low to resist. Tonda Rush, director of newspaper plans and projects for ANPA, summarized these forces:

“It appears that making recycled newsprint is cheaper than making virgin [newsprint], and that it is enough cheaper [sic] to allow for the \$30–\$50 million capital investment that a virgin mill would have to make to begin de-inking old newspapers. . . . If producers know newspapers want recycled paper, more of them will begin the two- to three-year process of developing de-inking capacity and making a high-quality newsprint available.”⁴⁶

The market’s reaction can be described in simple economics as follows (see figure 1). Due to mandated collection programs, the supply of ONP greatly increased (S to S'). The market’s short-term demand curve for ONP was essentially vertical,⁴⁷ because the capacity of the newsprint industry to use ONP is limited by the available equipment. The price fell, from P_1 to P_2 . Due to uncertainty of ONP supply in the long term and the high cost of capital, the newsprint industry was slow to add de-inking capacity. External

forces, including government mandates and reader preferences, caused the demand for recycled newsprint to increase (D to D'). The prospect of continued high supplies of ONP, as well as guaranteed long-term demand, acted to spur the newsprint industry to invest in de-inking capacity. The increased capacity is expected to bring the price positive again (to P₃), helping assure the political survival of curbside recycling programs, thereby extending the life of our cities' landfills. Note that the new capacity itself will serve to assure that a high amount of ONP is recycled. Just as ONP capacity is difficult to add, so is it difficult to remove.

It could be argued that the low price for newsprint would eventually have led to the same outcome. This may not have been the case. High capital costs, the need to transport ONP over long distances, the integrated nature of the pulp and paper industry, and the costs of developing new supply lines may have combined to outweigh any price advantage of ONP. In addition, before the recent environmental push, newspapers were demanding paper of increasingly higher quality, like that used in *USA Today*, which is made from 100 percent virgin pulp. Manufacturers were not going to switch to ONP simply because it was less expensive than pulpwood.⁴⁸ It was the guarantee of markets for recycled newsprint as well as the threat of lost markets for virgin newsprint that spurred the change.

Conclusion

The general view among solid waste experts is that the crisis in ONP recycling has passed.⁴⁹ Demand for ONP is coming back in line with the mandated supply. Investment in recycling mills is being made and public pressure has led many newspapers to commit themselves to using recycled newsprint. It is now in the interest of both of these industries to press for increased newspaper recycling. Keeping the supply of ONP high will keep the price for the mills' raw material down, which will, in turn, act to stabilize the price of newsprint for newspaper publishers.

Although legislation requiring specified recycled content for newsprint is not the economist-preferred instrument for increasing the recycling of newspapers, the rise of such regulations has served to spur both newsprint manufacturers and newspaper publishers to develop effective, efficient, and sustainable systems that will do just that. Without the threat of control, the market would not have responded as quickly. The industry has essentially reached a new equilibrium with a higher rate of recycling.

Notes

1. According to the US EPA definition, municipal solid waste (MSW) includes wastes such as durable and nondurable goods, containers and packaging, food and yard wastes, and miscellaneous inorganic wastes from residential, commercial, institutional, and industrial sources. MSW does not include waste from other

sources, such as municipal sludge, combustion ash, and industrial nonhazardous process wastes that might also be disposed of in municipal landfills or incinerators. [See US EPA *Characterization of Municipal Solid Waste in the United States: 1990 Update*, (June 1990), p. ES-2 and pp. 2-3 for full definition].

2. United States Environmental Protection Agency, *Characterization of Municipal Solid Waste in the United States: 1990 Update*, (June 1990), pp. ES4-ES8. Recovery does not automatically equal recycling or composting. The EPA definition includes materials separated for these purposes but which go instead to landfills or incinerators if, for example, markets for recovered materials are not available (*ibid.*, p. ES-2).

3. In 1988, 13.3 million tons of newspapers were generated (7.4 percent of municipal solid waste). This was second only to corrugated boxes (23 million tons, or 13 percent of total 1988 generation). Unlike newspapers, however, corrugated boxes are generally found in the commercial rather than the household waste stream, and over 45 percent of them are recovered. [EPA, *op. cit.*, pp. 39, 41].

4. The price for a ton of loose newspaper at dealer's door in the New York city area dropped from five dollars in July 1988 to zero in January 1989. From January to July 1989, the price fell from zero to negative thirty-five dollars. McEntee, Ken "Paper-makers Pushed to do More Recycling." *Recycling Today*, 1990 Vol. 28, No. 2 (February 15), p. 123.

5. This was most likely to happen when the landfill was city-owned, and the loss of landfill space was not seen as having a cost.

6. *ibid.*, p. 123; Holusha, John, "The Push to Recycle Newsprint," *New York Times*, November 7, 1990, pD9(L); Paul, Bill, "For Recyclers, the News is Looking Bad: Newspaper Glut Forces Towns to End Projects." *Wall Street Journal*, August 31, 1989, pB1(E); Paul, Bill, "Market for Recycled Newspapers in U.S. Collapses, Adding to Solid Waste Woes." *Wall Street Journal*, Jan 25, 1989, pB4(E); Knight, Jerry, "Newspaper Industry on Collision Course with Environmental Groups Over Recycling." *Washington Post*, Sept 26, 1989, p. C3; Boerner, Deborah A., "Recycling the Paper Forest." *American Forests*, Vol. 96, No. 7-8 (July-August, 1990), p. 38.

7. New York Newspaper Publishers Association, New York State Department of Economic Development, New York State Department of Environmental Conservation. *Final Report of the New York State Newspaper Recycling Task Force*, December 12, 1989 (NYNPA, *et al*, *Final Report*), pp.13-14.

8. ONP is the largest export from the port of New York.

9. American Newspaper Publishers Association (ANPA), "[Legislative] Summary Sheet," [prepared by Carin I. Fischer, Senior Associate, State Affairs, ANPA] January 3, 1991.

10. NYNPA, *et al*, *op. cit.*, p. 13.

11. Charles S. Rowe, Editor and Co-publisher, *The Free-Lance Star*, Fredericksburg, VA. Testimony on behalf of the American Newspaper Publishers Association before the House Subcommittee on Transportation and Hazardous Materials on RCRA Reauthorization, January 25, 1990.

12. Sparks, Edward P., "What's ahead for the wastepaper market?" *BioCycle*, 1990

VOL. 31, NO. 1 (January), pp. 31 & 64.

13. see Boerner, Deborah A., "Recycling the Paper Forest," *American Forests*, 1990 VOL. 96, NO. 7-8 (July-August), pp. 38-39, and John Holusha, "The Tough Business of Recycling Newsprint." *New York Times*, January 6, 1991, sec. 3, p. 9, for excellent descriptions of the de-inking process.

14. NYNPA, *et al*, *op. cit.*, p. 47.

15. NYNPA, *et al*, *op. cit.*, pp. 29-30; Sparks, Ed, "Recycled Newsprint Production in North America." *Resource Recycling*, 1990 VOL. IX, NO. 4 (April), pp. 54-55.

16. NYNPA, *et al*, *op. cit.*, pp. 29-30.

17. Powell, Jerry, "The further development of the de-inked newsprint market." *Resource Recycling*, 1990 VOL. IX, NO. 3 (March), p. 30.

18. NYNPA, *et al*, *op. cit.*, p. 10; Powell, Jerry, "The further development of the de-inked newsprint market." *Resource Recycling*, 1990 VOL. IX, NO. 3 (March), p. 30.

19. Powell, Jerry, *op. cit.*, p. 30.

20. NYNPA, *et al*, *op. cit.*, pp. 31-36; *inter alia*.

21. Mary A. Anderson, "The Newsprint Recycling Challenge, Part II: Governments Join Groundswell to Recycle." *Presstime*, December 1989, p. 28; Lipschutzhe, Neal, "Recycling Efforts Outpace Capacity to Use Old Papers." *Wall Street Journal*, Oct 1, 1990, col 6 pB16E(E).

22. Walter O. Spofford, Jr., "Solid Residuals Management: Some Economic Considerations." *Natural Resources Journal*, (University of New Mexico School of Law, Albuquerque), vol. 11, no. 3 (July 1971), p. 589.

23. NYNPA, *et al*, *op. cit.*, p. 47.

24. USEPA, *op. cit.*, p. ES-5.

25. OECD, *op. cit.*, pp. 76, 78.

26. Mary A. Anderson, "The Newsprint Recycling Challenge, Part II: Governments Join Groundswell to Recycle." *Presstime*, December 1989, p. 28.

27. NYNPA, *et al*, *op. cit.*, fn 2, p. 41.

28. Mark Fitzgerald, "Recycling and the Government; Fear of Government Intervention is Sparking Recycling Efforts by the Newspaper Industry." *Editor & Publisher*, v123 (July 14, 1990), p. 20.

29. Florida implemented a \$.10 per ton tax on virgin newsprint in 1988. With newsprint selling for about \$650 per ton, this tax has not been a significant force for change.

30. "Urges Voluntary Recycling of Newsprint." *Presstime*, October 1989, p. 52.

31. Mary A. Anderson, "The Newsprint Recycling Challenge, Part II: Governments Join Groundswell to Recycle." *Presstime*, December 1989, pp. 26-28.

32. Homer E. Taylor, purchasing, Knight-Ridder, Inc., "Letter To All Suppliers," dated August 29, 1989.

33. NYNPA, *et al*, *op. cit.*

34. American Newspaper Publishers Association, *Read. Then Recycle*, February 1990, p.15.

35. NYNPA, *et al*, *First Progress Report of the New York State Newspaper Recycling Task Force Monitoring Committee*, June 1, 1990, pp.1–2; NYNPA, *et al*, *Final Report*, pp. 59–65.

36. On September 25, 1990, the Jefferson Smurfit Corporation, the nation's largest producer of recycled newsprint, announced plans for a mill that annually will produce 275,000 tons of recycled newsprint from 330,000 tons of ONP. The mill should take three to four years to complete. [Wire News Network, transmission to J. S. Prendergast, American Newspaper Publishers Association, September 25, 1990; John Holusha, "Smurfit Plans to Build Paper Recycling Mill." *New York Times*, October 2, 1990, p. D4.]

37. Charles T. Brumback, President, Tribune Company. Testimony on behalf of the American Newspaper Publishing Association before the United States Senate Committee on Energy and Natural Resources, Subcommittee on Energy Regulation and Conservation hearing on S.2923 (a "recovery credit" bill), August 2, 1990.(2), p. 2; NYNPA, *et al*, *Final Report*, pp. 37–38; Sparks, Ed, "Recycled Newsprint Production in North America." *Resource Recycling*, 1990 VOL. IX, NO. 4 (April)(29), p. 52; *inter alia*.

38. OECD, *op. cit.*

39. NYNPA, *et al*, *op. cit.*, pp. 7–8; Rosalind C, Truitt, "The Newsprint Recycling Challenge, Part I: Newspapers Set Sights on Helping to Ease Problems of Waste." *Presstime*, December 1989, p. 23; Sparks, Ed, "Recycled Newsprint Production in North America." *Resource Recycling*, 1990 VOL. IX, NO. 4 (April), p. 52; *inter alia*.

40. NYNPA, *et al*, *op. cit.*, p. 7.; Sparks, *op. cit.*, p. 52; Truitt, *op. cit.*, p. 23.

41. Sparks, *op. cit.*, p. 52.

42. In a May 29, 1990 speech before the Conference Board of Canada Business Outlook Conference, H. Mason Sizemore, president and chief operating officer of the *Seattle Times* stated: "...newspaper publishers in the United States have committed [themselves] to using much more newsprint containing recycled fiber. If we can't get it from our traditional suppliers, we will find suppliers who can provide it."

43. American Newspaper Publishers Association, Press Release, "Newsprint Recycling Projects—North America: 1990–1992." November 7, 1990. Not all of this new capacity meets the US EPA 40 percent standard. Some will be 20 percent recycled or less.

44. Sparks, Edward P., "What's ahead for the wastepaper market?" *BioCycle*, 1990 VOL. 31, NO. 1 (January), p. 64; Sparks, Ed, "Recycled Newsprint Production in North America." *Resource Recycling*, 1990 VOL. IX, NO. 4 (April), p. 52.

45. Sparks, *op. cit.*, p. 52.

46. "Ready, Set, Recycle," *Scripps Howard News* (in-house newsletter), October 1989, p. 49.

47. T. Plant, *An Economic Analysis of Regional Waste Paper Markets*, Regional Science Institute (Philadelphia), 1978, estimated the price elasticity of demand for waste paper to be zero, and of supply to be between 0.19 and 0.29.

48. Debra A. Garcia, newsprint specialist, *Pulp & Paper* magazine. Personal communication, January 15, 1991.

49. Tom Polk, marketing director, City of New York Recycling Program. Personal communication, January 14, 1991.