

Findings / Recommendations

MARKETS ASSESSMENT 1998

FINDINGS

This section summarizes the results of the analyses of all the commodities presented previously, and assigns high, medium, or low priorities to each category. This section also presents overall recommendations to stimulate recovery and/or demand for most commodities.

Twelve million tons of municipal solid waste were generated in North Carolina in 1997, and eight million tons were disposed. Construction and demolition (C&D) debris made up the largest component of the disposed waste (29 percent), and paper made up another 18 percent. Organic materials made up about 12 percent of the waste stream, and wood 11 percent. All other materials each made up 10 percent or less.

A conservative estimate of the total tonnage of material recycled in 1997 is 4.1 million tons, which yields a 34 percent recycling rate. When the statewide recycling rate was calculated in 1995, it was estimated at 22 percent (2.1 million tons recycled and 7.6 million tons disposed).

The recycling rates for specific commodities vary. Container recovery rates tend to be low, especially for plastics. Although the paper recovery infrastructure is well established, there is still room for growth in many grades, especially magazines, mixed paper, and office paper. Some other materials are virtually untouched in terms of recycling potential, including C&D, electronics, food residuals, most plastics, and textiles.

Despite limited recovery in some categories, the 1998 assessment found a thriving industry that continues to grow and change. The past several years have seen the introduction of new technologies, expansion of collection systems, and considerable fluctuations in foreign and domestic economic cycles. In addition, recycling companies (both processors and end users) are consolidating in many sectors.

Since the last assessment was conducted, North Carolina has provided business management, technical and financial assistance to 608 businesses. In that period, 185 jobs were created and \$5.05 million were invested. The total volume of new capacity created was 217,000 tons per year. More than half of that capacity was construction and demolition (C&D) debris processing.

Another significant development since the last industry assessment is the inception of a recycling business loan fund, supported by the N.C. Department of Environment and Natural Resources (DENR), the U.S. Environmental Protection Agency (EPA), and the Self-Help Ventures Fund (Self-Help). This fund will be administered by Self-Help, and the project will offer at least \$660,000 in loans to recycling businesses. These loans are expected to create or retain at least 80 jobs, provide 115,000 tons per year of recycling capacity, and leverage an additional \$330,000 of private investment.

PRIORITIES

The ultimate goal of this assessment is to chart the state's current recycling course and to identify where market development assistance is needed to stimulate gains in recovery. As a result of the analyses of 26 commodities in 12 categories, each commodity has been assigned a priority for action.

High priority commodities typically warrant immediate market development assistance and offer opportunities for

infrastructure and market development that justify the application of technical, financial, and policy resources. They also often constitute a significant and growing portion of the waste stream or pose potential environmental and health threats. Medium priority commodities require more limited assistance and tend to constitute a smaller portion of the waste stream. Low priority commodities have mature markets and typically do not require action from the state. The recyclable materials analyzed below are divided into high, medium, and low priorities.

High Priority

C&D Debris: C&D commodities (e.g., wood, wallboard, concrete, brick, etc.) as a group need market development assistance. C&D debris represents about a third of North Carolina's waste, yet recovery efforts are limited, primarily because recovery in the state has been focused on other materials and the incentives for disposal diversion have been low. In addition, this portion of the waste stream has only recently been characterized. A variety of activities could stimulate recovery and demand, including state support of demonstration projects and recycled content procurement standards. The state should continue to identify and assist entrepreneurs that are processing various C&D materials and help expand or replicate those operations around the state. In addition, local governments should be encouraged to establish recovery operations either by contract with C&D recovery firms or through their own operations.

Organic Materials: The compost market, which represents demand for food residuals and yard waste, is still developing and needs assistance. While the demand for yard waste appears to meet the available supply; efforts are needed in several areas to improve recovery of food residuals. Demand for compost utilizing recovered edible foods, animal feeds and food residuals appears adequate to significantly increase the diversion rate. Developing efficient collection and processing techniques could stimulate recovery, and efforts to increase market awareness of the benefits of compost and mulches would further strengthen demand.

Paper: Although most paper markets are mature, recovery rates in North Carolina are below national averages, even for higher value papers such as office grades and old corrugated containers (OCC). For this reason, the state should support the development of infrastructure to improve recovery efficiency and rates. Findings for each paper grade follow:

- **OCC:** Demand for OCC is not likely to increase beyond minimal annual growth until it has been shown that OCC recovery can increase significantly over cur-

rent levels. Small retail / commercial and residential sectors are two segments of containerboard supply that are far from reaching maximum achievable recovery levels, and they should be targeted for increased recovery efforts.

- **Office Paper:** It appears that growth in office paper demand has exceeded growth in supply, and future supply may not be adequate to meet projected demand. Recovery in North Carolina is well below the national average and could be increased by encouraging the creation of mixed commercial paper routes and focusing on small retail / commercial generators.
- **Old Magazines (OMG):** Demand for OMG in the southeast region could be characterized as consistent and growing, but OMG supply remains unstable. North Carolina has potential to increase its recovery of OMG by encouraging the addition of OMG to local government collections and by focusing on long-term strategies that stimulate demand (e.g., cooperative and mandatory incentives for higher recycled content newsprint).
- **Old Newspapers (ONP):** Nationally, the market for ONP has a fairly stable demand structure with steady supply sources, and this trend is projected to continue in the near future. North Carolina could play a leadership role in the region by reviewing the current recycled content mandates in order to account for possible improvements in mill capacity. Increasing recycled content purchase could improve prices and overall mill appetites for recovered ONP.
- **Residential Mixed Paper (RMP):** The supply of RMP exceeds demand, and this oversupply is expected to continue during the next five years. There is still room for growth in mixed paper recovery; however, stronger demand is needed to justify increased recovery. Research and demonstration of secondary markets for recovered mixed paper could stimulate demand, as could market building alliances focused on recycled paperboard users.

Used Oil Filters: Despite a landfill ban on used oil, a significant amount of residual oil from oil filters may have entered North Carolina landfills in 1997. According to feedback from recycling companies in the Southeast region, infrastructure and markets for all three components of used oil filters are sufficient to justify a disposal ban.

Wood: Industrial wood residues and to a lesser extent pallets are among the most promising materials in the state in terms of potential for increased diversion. The demand for wood residues in particular appears to be greater than the supply. Primary manufacturers have well-established markets for their residues and achieve high recovery rates. Secondary wood products manufacturers, in contrast, must

process their residues to marketable form. By increasing recovery in the latter sector, North Carolina could reduce materials being landfilled by four percent. In addition, North Carolina's pallet recycling infrastructure appears healthy and growing, and market demand for pallets is also strong. A higher recovery and diversion of pallets will be an important part of the overall management of wood resources in North Carolina.

Medium Priority

Electronics: Although increasing quantities of computers and other electronics are being generated in North Carolina, recovery options are just developing. Existing efforts tend to be limited to larger businesses, leaving small businesses and households without recycling options. Increasing the quantity of electronic equipment recovered from these sectors would require substantial funding from local, state, or federal governments. Pilot projects might offer a chance to examine the economics of local collections and should be encouraged. Additionally, the state should develop a formal disposal policy for electronics because of the potentially hazardous components.

Plastics: Plastics should be targeted for market development assistance; however, limited actions can be taken by the state. Virgin price supports for plastic are very complex, because oil is the raw material; therefore, state actions are generally limited to encouraging the purchase of recycled content plastic products. Recycling is projected to increase 10 percent annually over the next several years, and high-density polyethylene (HDPE) and polyethylene terephthalate (PET) will remain the dominant recycled resins due to their predominance in the bottle marketplace as well as their ease of collection and separation. State and local agencies could also stimulate recovery by working with generators of linear / low density polyethylene (L/LDPE). The overall processing capacity in North Carolina is more than sufficient for the supply generated, and it is expected that the demand for recycled plastics will increase through 2000.

Used Oil: The used oil market requires limited immediate assistance from the State. Based on the current indications of strong demand, North Carolina has an opportunity to recover much of the remaining used oil throughout the state. In particular, the state should focus on increasing the recovery of used oil from the do-it-yourself sector. An advance disposal fee on motor oil purchases could be used to help finance collection.

Low Priority

Glass: Color-separated glass is a mature market and warrants little or no immediate attention from the state. The supply of processed flint and amber cullet in North Caro-

lina and the southeast is well below the potential demand. Without significant efforts to increase supply, this trend is expected to continue until 2002 and beyond. On the other hand, demand for green cullet is likely the same as supply and most likely will not deviate from this pattern to 2002. It appears overall that the focus of the glass industry is on improving the quality of the current supply rather than increasing quantity. Efforts to increase the markets for mixed cullet and to encourage more efficient handling of collected glass should be investigated.

Aluminum and Steel Cans: Used beverage containers (UBCs) have a stable market warranting little attention from the state. Demand for UBCs and other aluminum scrap remains strong enough for the material to be recycled by local governments and private industry. An increase in UBC recovery statewide depends more on improved collection efficiency than increased capacity or markets for the material. Markets for other scrap, such as steel cans, will need assistance to fulfill the potential for growth. The demand for steel can scrap continues to exceed the supply both nationally and locally, and the ability to increase steel can recycling is not dependent upon future capacity increases. With approximately 90 percent of the supply of steel cans remaining in the waste stream, new or existing recycling businesses should be able to capture the remaining share. However, market prices will continue to be negatively affected by the global economic downturn.

Textiles and Carpet: Post-industrial textiles are a mature market and warrant little or no immediate attention from the state. Post-consumer textiles are not as well established and may justify limited assistance in the form of grants to local governments. The textile recycling industry is currently struggling with low demand (again because of the global market situation), which may limit expansion of local government collection efforts in the short-term. Carpet recycling programs are developing rapidly, and infrastructure will need to be developed to meet recently increased demand. The key to increasing carpet recovery lies in establishing the collection infrastructure.

Tires: The recently established program of tire end-use grants represent a major investment by the state in tire market development, and no additional assistance is needed at this time.

White Goods: No additional assistance is needed at this time. Sufficient market capacity exists for the consumption of all white goods generated in North Carolina and its border states today and through the year 2002, assuming that the percentage of steel in white goods is not displaced by other, less recyclable materials. Continuing the North Caro-

lina White Goods Management Program is an important strategy for the foreseeable future.

OVERALL RECOMMENDATIONS

Policy Recommendations

The following policy recommendations would stimulate recovery and/or demand for recycled materials in North Carolina.

- **Implement disposal bans for recyclable materials with well-established collection infrastructure and strong market demand.**

One of the most cost-effective ways to divert material from landfills and incinerators is to enact and enforce material disposal bans or diversion policies. Such measures encourage waste reduction by either (1) explicitly excluding materials from disposal or (2) establishing disposal disincentives through surcharges on loads, weights, or volumes of a targeted material beyond a given threshold. This assessment has identified three materials with adequate recycling infrastructure to support a disposal ban: pallets, used oil filters, and OCC.

The state should implement a statewide municipal solid waste and C&D disposal ban on pallets by 2002; this ban should not include pallets destined for recovery operations at landfills. North Carolina's pallet recycling infrastructure is strong and growing, and market demand for pallets appears strong and will probably increase. Factors like third party management may decrease new pallet production and should also reduce pallet discards. Because of the growing and multi-faceted recovery infrastructure, a much higher diversion rate for pallets is possible.

Similarly, the state should also ban the disposal of used oil filters. More than 256,000 gallons of residual oil from oil filters may have entered North Carolina landfills in 1997. With projections of continued population growth in North Carolina over the next few decades, the issues of proper oil and filter management will become increasingly critical to preserving the integrity of the state's environment and natural resources. Because of the residual oil contained in these filters, the state should not consider the ban on used oil from landfills complete until used oil filters are also banned from disposal.

The state should also consider implementing a statewide landfill ban on OCC. Such a ban would be an effective way to target the disparate group of small retail / commercial generators and residences that con-

tinue to discard OCC rather than recycling it. Sufficient infrastructure exists to manage OCC, and demand is strong and projected to remain so in the future. More than 30 North Carolina communities have already implemented local OCC bans or restrictions, and three states (Massachusetts, South Dakota, and Wyoming) have bans on recyclable paper including OCC.

Any material ban would be dependent on additional funds for local government recycling programs.

- **Expand procurement of recycled and environmentally preferable products by state and local governments.**

State and local governments can support stabilized, long-term demand for recycled products by incorporating preferences for such products into purchasing guidelines and by specifying the highest levels of recycled content possible. The assessment of the recycling industry in North Carolina identified the following commodities as candidates for purchasing targets for both state and local governments:

- **Carpets:** Agencies should make it a priority to recycle carpets that are being replaced. Additionally, in the bidding process for purchasing new carpet, agencies should specify recycled content carpets or carpet from manufacturers with take-back programs that ensure reuse or recycling.
- **C&D Debris:** The state should continue to support the North Carolina Department of Transportation's initiatives for using recycled C&D materials in place of virgin materials in transportation related projects. The state should also recommend the further use of recycled C&D materials by other state agencies such as State Construction.
- **Electronics:** Agencies should explore the possibility of leasing or buying computers and other electronics from manufacturers with take-back programs. Such companies would need to have reuse and recycling programs for the returned equipment. Guidelines could also include preferences for leasing programs, equipment that is recyclable or has recycled content, or equipment that exhibits other design for environment characteristics (e.g., easily upgradable, energy saving functions).
- **Newsprint:** As a result of technical improvements in manufacturing processes, the state should reconsider its current recycled content goals and consider working with publishers and newsprint manufacturers to establish additional recycled content targets beyond the year 2000. The state should

also review exceptions granted under the current 35 percent regulations.

- **Office Paper:** Agencies should continue to purchase recycled content paper with the highest level of post-consumer content possible. The state should increase its efforts to purchase recycled papers by adopting the same guidelines as outlined in the federal Executive Order 13101, which directs agencies to ensure that they purchase *only* recycled paper.
- **Oil:** To demonstrate leadership and bolster the demand for re-refined oil, agencies should use only re-refined oil in their motor vehicle fleets.
- **Wiping Cloths:** Agencies should specify industrial wipers made from recycled textiles where possible.

In addition to increasing environmentally preferable product procurement, agencies should promote recycled product procurement by the private sector, including promoting membership in the North Carolina Buy Recycled Business Alliance. Finally, continued education on environmentally preferable products is necessary. The state should identify manufacturers of recycled content and environmentally preferable products in North Carolina and provide information on product testing and evaluation, where possible.

- **Fund and implement oil and oil filter initiatives outlined in the General Statutes and in the 1992 state solid waste management plan.**

The state should seek to fulfill the responsibilities established in North Carolina General Statutes 130A-309.16 and 309.21-22. There is a tremendous need for public education to improve the recovery rate of used oil from do-it-yourself sources. As indicated in the statute, the state should support an education campaign to raise the awareness of proper oil and filter management methods and to increase the proliferation and visibility of public and private drop-off collection sites.

- **Develop an enforcement policy for items that contain cathode ray tubes (CRTs), such as computer monitors and televisions.**

The state should develop a policy exempting CRTs from hazardous waste requirements, or impose less stringent regulations, as it has done for lights containing mercury, when these materials are destined for recovery. Several states have accomplished this objective by adopting CRT-containing items under the Universal Waste Rule, and the U.S. EPA has expressed support for this approach.

Programmatic Recommendations

The following programmatic recommendations would stimulate recovery and provide data that would enable informed waste management decisions.

- **Gather data on specific waste streams to enable informed decision-making.**

Limited data were available for several of the commodities that comprise the largest portions of the state's waste stream. Further research would provide North Carolina-specific data that would enable informed decision making on the best ways to divert these wastes from landfills. This research could also identify the types of processing and manufacturing businesses best positioned to handle the quality and quantity of materials in each category.

- **C&D Debris:** More information is needed to determine the most cost-effective means of diverting C&D materials directly from landfills. The state should consider conducting a study to evaluate mixed materials processing and other recovery methods on or adjacent to landfill sites.
- **Food Residuals:** Estimates of food residuals generation in North Carolina need to be refined. The state should sponsor a food waste generation study focused on developing accurate data on food residuals quantities, sources and locations using curbside studies in several different communities that are representative of North Carolina.
- **Wood Residues:** Better data are needed on generation of and demand for wood residues. The state should try to gather more accurate data on (1) the specific generators and tonnage of wood residues coming from manufactured housing, commercial and residential sources, and secondary wood product manufacturers and (2) the demand for recovered wood residues in the fuels and manufactured product markets.
- **Vegetative Debris in Land Clearing and Inert Debris (LCID) Facilities:** The state should conduct a detailed assessment of the sources and amounts of vegetative debris going to LCID facilities and evaluate the technological and economic obstacles to increased diversion of these materials.
- **Commercial / Industrial Textiles:** The characterization of post-consumer textiles generated from retail outlets could not be determined during this assessment and should be further investigated by the state. Similarly, limited information is available on post-industrial textiles. The state should con-

duct a study of the generation and recovery of post-industrial textile waste in North Carolina.

- **Enhance local government program efficiency to increase recovery.**

To increase the quantity of recyclable materials collected throughout the state, equitable, waste reduction-based collection systems such as pay-as-you-throw (PAYT) should be encouraged. Improvements to the quality and consistency of material supplies could enable local governments to net higher prices and possibly encourage increased utilization of recyclable materials. The Division of Pollution Prevention and Environmental Assistance (DPPEA) has encouraged PAYT through its Solid Waste Reduction Assistance Grants and other efforts; these efforts should continue as a primary means of increasing program efficiency.

Another way to increase recycling rates is to add new materials to existing programs. Market analyses have identified the following materials as candidates for addition to local programs: mixed paper (also referred to as RMP), old magazines, OCC as part of an RMP or office mix, textiles, and steel cans. Local governments should evaluate the waste stream and local / regional markets before materials are added. In some cases, industry associations, such as the Steel Recycling Institute, may help launch campaigns and develop educational materials encouraging materials to be added.

- **Target the small retail / commercial sector to increase recovery.**

In general, targeting this under-served sector would increase material capture and program efficiency. Several opportunities exist for targeting this sector. Local governments should be encouraged to expand their capabilities to assist small retail / commercial generators, for example by dedicating staff or programs to this sector. Another option is to facilitate cooperative marketing among small businesses that otherwise might not generate sufficient materials to realize economies of scale in recycling. Finally, local governments should develop campaigns encouraging this sector to implement recycling for materials commonly generated by this sector with relatively stable markets, such as OCC, office paper, steel cans, and glass.

- **Increase plastics recovery through incentives and promotion of recycled product procurement.**

Plastics are gaining market share from other containers that are recycled at higher rates. In general, the state should consider increasing the availability of financial

incentives, including grant funding for capital purchases that improve collection efficiencies and economic development incentives for end-users, to enhance PET / HDPE / low density polyethylene (LDPE) / polypropylene (PP) recovery and use. If consistent improvement in recovery of these resins is not achieved by 2002, the State should consider implementing statutory mechanisms such as take-back requirements, mandated recycled-content targets, and other command-and-control approaches.

Additional actions are warranted for specific resins. For example, North Carolina's business and industry should identify opportunities to recover L/LDPE materials used in packaging and transport. With polyvinyl chloride (PVC) bottles a major contaminant of recovered PET bottles, the state should consider actions to discourage the use of PVC for bottle stock sold in the state. Finally, the state, local governments, and generators, processors, and end users of vinyl siding should work to maximize its recovery to take advantage of apparent strong markets for the material and a growing infrastructure.

- **Continue to educate government, business, industry and the public on the need for and benefits of recycling.**

The state should continue to foster the reduction and recycling of various materials through education of citizens, businesses, industries, and local governments. This education could take the form of meetings, workshops, or publication and dissemination of research. The two primary goals should be increasing awareness and changing behavior. Based on this market analysis, two commodities that need special emphasis on education are C&D debris and steel cans.

- **Continue to promote source reduction.**

Source reduction should continue to be promoted by state and local governments, and they should show leadership in this area. Specific source reduction measures recommended in this report include the following:

- Encourage the use of by-pass filters in vehicles as a means of maintaining cleaner oil in engines and decreasing the frequency of oil changes.
- Encourage the use of longer-lasting synthetic oils
- Educate citizens on the opportunity to reduce oil change frequency.
- Reduce or eliminate the use of non-recyclable materials, such as polystyrene.
- Encourage local governments to implement backyard composting programs.

Other commodity profiles available

from the Division of Pollution Prevention and Environmental Assistance are:

Construction and Demolition Debris ▪ **Electronics** ▪ **Glass** ▪ **Metals** [*Aluminum Cans and Scrap, Steel Cans and Scrap*] ▪ **Oil-Related** [*Used Oil, Used Oil Filters*] ▪ **Organics** [*Food Residuals, Yard Wastes*] ▪ **Paper** [*Old Corrugated Cardboard, Old Newspaper, Old Magazines, Office Paper, Mixed Paper*] ▪ **Plastics** [PET (#1), HDPE (#2), PVC (#3), L/LDPE (#4), PP (#5), PS (#6)] ▪ **Textiles** [*Carpet, Post-Consumer Textiles*] ▪ **Tires** ▪ **White Goods** ▪ **Wood** [*Wooden Pallets, Wood Residues*]

To explore these profiles electronically, visit www.p2pays.org. For additional information, contact 919.715.6500 or 800.763.0136.

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