THE OUTER LIMITS OF PAPER RECOVERY AND RECYCLING

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THE PAPER INDUSTRY MUST BE PROACTIVE IN PRESENTING WHAT HAS BEEN ACCOMPLISHED IN RECYCLING AND WHAT CAN REASONABLY BE EXPECTED IN THE FUTURE.

BECAUSE OF THE ENORMITY OF THEIR SOLID WASTE disposal problems, many states and some cities have imposed mandatory solid waste reduction goals, and other states and cities are considering doing so. Some state goals for solid waste diversion reach as high as 50%, and published timetables generally do not allow a great number of years for reaching those goals.

Reducing the amount of garbage that the American people dump into the earth must be seen as a very positive social change. However, positive social changes generally will also have some unintended negative consequences. In this case, some of the potentially negative consequences of great leaps forward in solid waste reduction may fall on the paper industry. While the solid waste diversion goals include all types of solid waste, they will have a major impact on paper recycling, because paper and board constitute such a large percentage of the material going into landfills.

This brings us to the two sides of the solid waste reduction question. Municipal solid waste (MSW) managers are asking recyclers to cooperate with a program that is beneficial to the general environmental health, but those who recover and recycle paper are questioning whether they are being presented with too much of a good thing for their own economic health.

The paper industry's view—and it has the facts to back it up—is that the industry has made great strides in recycling. The industry easily surpassed, well ahead of its own timetable, its initial goal of recovering and recycling 40% of domestic consumption of paper and board, and then set a new goal of recovering and recycling 50% of domestic consumption. (See **Fig. 1**.)

In the process, the industry has spent hundreds of millions of dollars on plant and equipment to recycle paper, and some companies have spent millions more on developing collection systems.

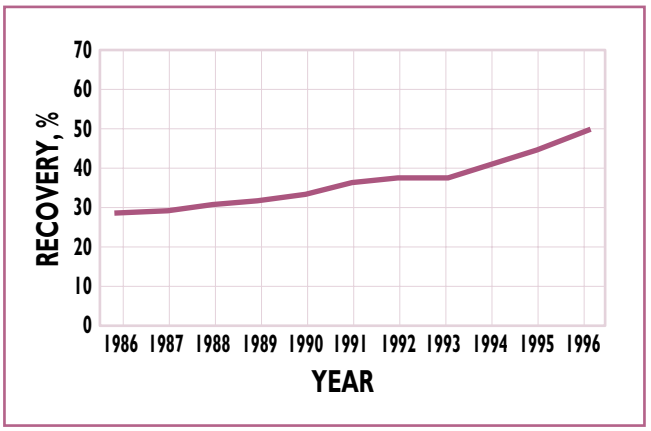
The percentage of domestic paper and board consumption that is recovered for recycling has risen from about 28% annually in 1986 to a present rate that is on track to reach 50%, the American Forest & Paper Association's stated goal for the year 2000. The U.S. paper industry's response to the call to benefit the environment by recycling has been nothing less than dramatic. Unfortunately, the public has not been informed of this response, and too many Americans still see papermakers only as bad guys who cut down trees, pollute rivers, and make the air smell bad.

Meanwhile, back at the landfill, MSW managers are asking recyclers to take more paper and board out of the waste stream. The paper industry's progress in recovery and recycling is far less apparent to them than the large quantities of paper still being tipped into the landfills.

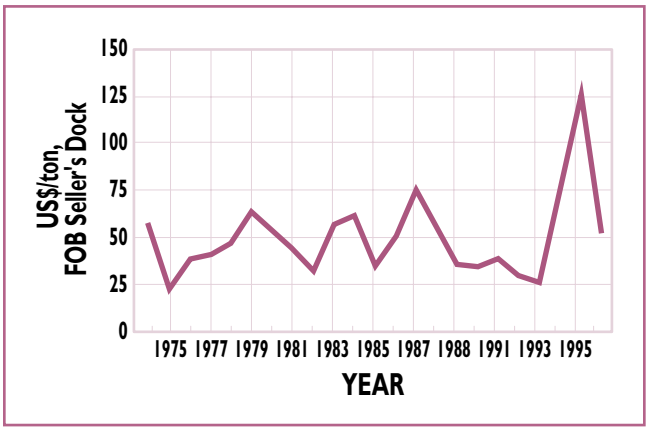
MSW managers generally see paper and board as one of the biggest problems in the landfill for two reasons. First, there really is a huge amount of paper and board still being dumped every day and, second, paper is so visible and apparent. The MSW managers also see municipal paper collection systems breaking down, usually not realizing that this is caused by the very success of those systems, which has often resulted in an oversupply of recovered paper, with prices depressed to the point of unprofitability.

OCC PRICES—A CASE IN POINT

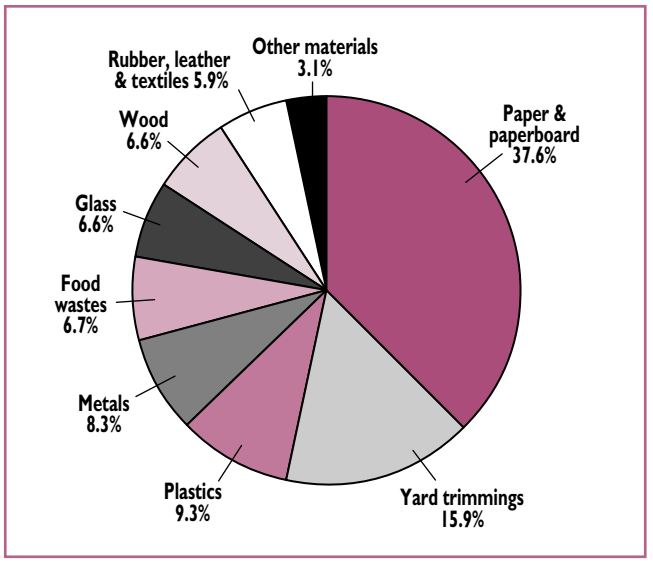
A specific case in point may be seen in the recent history of old corrugated containers (OCC). A plot of the per-ton selling price for OCC (FOB seller's dock) from 1974 to 1990 shows the price rising and falling in a range from US$ 22/ton to US$ 75/ton. The simple trend line of this price plot shows an average of about US$ 47 per ton. From 1990 to 1994, when the paper industry was in recession, the average price fell to about US$ 32 per ton. In 1995, however, the industry came out of its recession



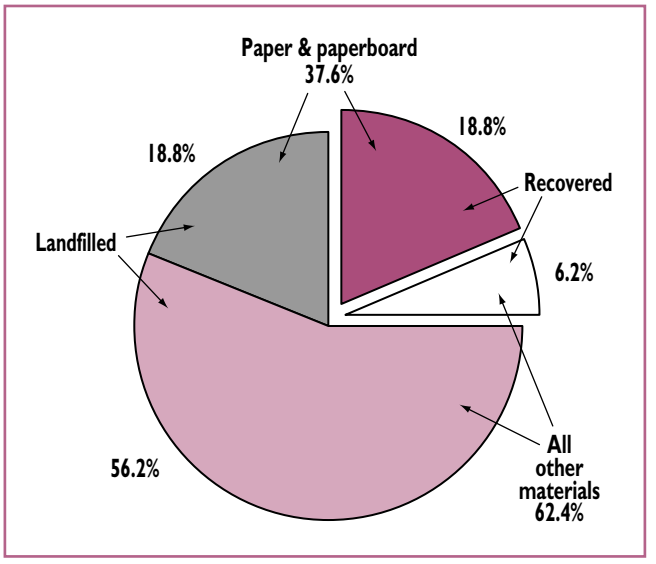
1. Recovery percentage



2. OCC price history (U.S. Annual Average)



3. Composition of MSW



4. Paper's relationship to other MSW in 1996

with a bang, and OCC prices soared to record high prices, which were greater than US$ 200 per ton. (See **Fig. 2**.)

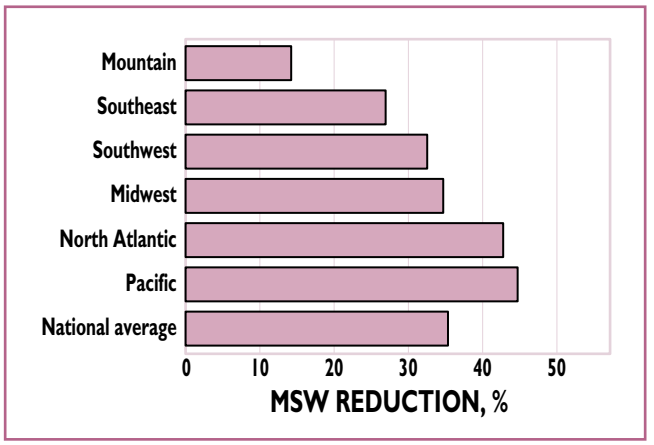
The OCC boom was short-lived, however. By the end of the year, prices had fallen again to about US$ 30 per ton and barely moved above US$ 60 per ton throughout 1996.

The prices of recovered papers are driven by five factors: available supply, mill demand, recovery costs, disposal costs, and the health of the national economy. All of these factors must be in some reasonable state of relative equilibrium before constant, large-scale diversion of paper from landfills can be maintained, let alone increased.

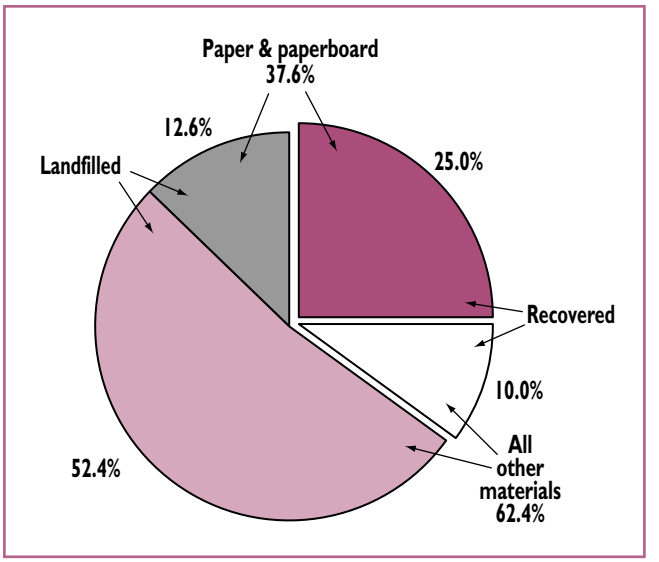
Demand factors are linerboard and medium mill operating rates and rate of substitution of other recovered papers. On the supply side, the influencing factors include OCC recovery rates and the effect of governmental regulations and mandates, such as MSW diversion levels.

Simply put, governmental influence can increase recovery of OCC, but it cannot increase the need for it unless more mandates on recycled content are established. When more OCC is available than board and medium mills need, the price falls and recovery follows prices. When OCC becomes too expensive, the rate of substitution grows, again triggering price declines and lowered recovery rates.

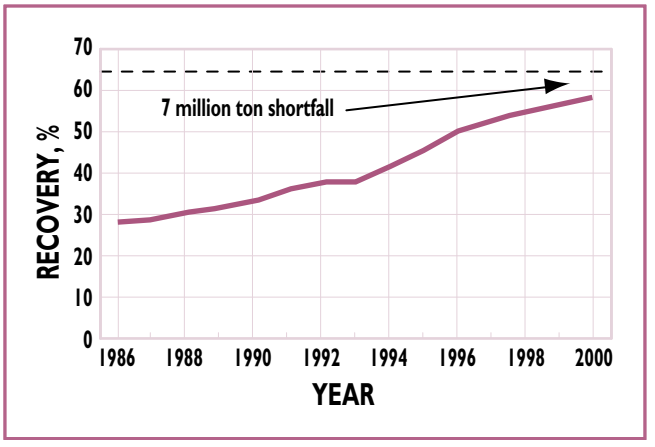
MSW managers and governmental agencies tend not to be aware of any of these factors other than available supply. They usually see only the large amounts of paper and board still going into their landfills. But it is simply



5. Mandatory MSW reductions (approx. year 2000)



6. Paper's relationship to other MSW in 2000



7. Can the paper industry make it?

shortsighted, if not wrong-headed, for governments to force the diversion of recyclables with no consideration of the markets for those recyclables. (See **Fig. 3**.)

PAPER DIVERSION RATE HAS LIMITS

The overall diversion rate for all recyclable, compostable, or combustible materials from the municipal waste stream is now around 25%. But the diversion rate for paper and board, which amount to 37.6% of the total weight of the stream, is rapidly approaching 50%.

At a 50% paper and board recovery rate, obviously, 18.8% of the total weight of the stream is being diverted. MSW managers are more likely to see, however, that 18.8% of the remaining stream weight still consists of paper and board—and this is still the largest single component of materials that are going into the landfill. (See **Fig. 4**.)

Paper will probably constitute about the same percentage of the waste stream in the year 2000 as it does today, 37.6% by weight, but it will also be, by a large measure, the largest diverted component. Paper recovery could divert as much as 25% of the entire stream weight out of landfills. (See **Fig. 5**.) But even this Herculean recovery effort may not be enough to satisfy municipal solid waste managers, who will still see only what is left and who will be asking, in desperation over their garbage problems, "But what have you done for me lately?"

Achieving total municipal solid waste diversion targets averaging 35% across the nation by the year 2000 would demand a paper and paperboard recovery rate of about 65%. (See **Fig. 6**.) No country has been able to achieve a recovery rate near 65%. Even Japan, whose efforts to recycle paper have been strenuous, has been unable to get its national recovery rate above 52%. Sweden, which has population densities and patterns totally unlike those of Japan, was recently reported to have attained the world's highest recovery rate, at 53%.

The amount of paper that could be recovered and recycled in the United States by the year 2000, even at maximum effort by the industry, is projected to be less than 60 million tons/year. Recovering close to 60 million tons of paper and board translates into a recovery rate of about 58%, a rate not yet achieved by any developed country. Can the U.S. paper industry achieve it? It seems unlikely. (See **Fig. 7**.)

But even at this seemingly impossible rate, the industry would be falling 7 million tons/year short of the rate required by state and local MSW diversion goals. Will such a shortfall bring increased pressure from federal, state, and local governments?

In conclusion, the nation will almost certainly see a large shortfall in the recovery of paper and board in rela-

tion to what municipal solid waste managers expect. The large amounts of paper and board remaining in the waste stream, even after the most strenuous recovery and recycling efforts by the paper industry, could result in mandated usage of recycled fiber by papermakers.

If it is to head off mandates of recycled content, the industry must be proactive in the presentation of what it has accomplished and what it can *reasonably* be expected to accomplish in helping to diminish the solid waste problem. **TJ**

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