



Disposition and End-of-Life Options for Personal Computers

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Introduction

The computer industry has seen remarkable growth—about 15% per year due to rapid operating system and processor upgrade cycles. In fact, 70 million PCs were shipped worldwide last year, 26 million of those in the United States.

Fortunately, fewer computers are being sent to landfills, as more are being recycled as markets for used electronic equipment develop. Many are still being stored, despite the unprofitable nature of storage. Our updated model suggests that nearly 150 million computers will be recycled in 2005—the same number initially predicted to be landfilled. Instead, we predict that only 55 million will be landfilled. In addition, the equivalent of 15 million PCs will be landfilled from the unused portions of the 150 million recycled computers. This is in comparison to a 1991 study which predicted 150 million in landfills by 2005.

The most significant change since the prior estimate has been the creation of many computer “recycling” firms. Computer “recycling” firms, both recycle and reuse products. However, some firms actually “recycle” electronic equipment, extracting value from the components or high value materials like gold and other precious metals.

In addition, consumers and businesses alike have shown a considerable unwillingness to throw away old electronic products. Instead, computers are often stockpiled in attics and storerooms until space is needed for another purpose. The existence of adequate storage space has contributed to the diversion of computers from landfills as well, as owners have had time to put off the disposition decision long enough for the recycling and reuse markets to mature.

Our Updated Model

A new computer is purchased, but eventually becomes obsolete. First, it could be reused. This means that it is somehow used again after becoming obsolete to the purchaser—possibly a result of being resold or reassigned to another user without extensive modification. Second, the computer could be stored by the original owner. In this case, it is serving no purpose except to occupy space. Third, the computer could be recycled. We define this to mean that the product is taken apart and

individual materials or subassemblies are sold for scrap. Finally, the computer could be landfilled.

We assume that computers generally become obsolete to the purchaser in five years. Stored computers are recycled or landfilled after eight years. Reused computers can be recycled or landfilled after 8 years; or they can be stored for three more years before then being landfilled or recycled, for a total of eleven years.

Based on these assumptions, Table 1 shows the parameters assigned to variables in the model. Parameters used in the original model are presented as well.

Parameters	Old Value	New Value
Initial Lifetime of PC	5 years	5 years
% Obsolete Reused	10 percent	45 percent
% Obsolete Recycled	1 percent	5 percent
% Obsolete Stockpiled	80 percent	45 percent
% Obsolete Landfilled	9 percent	5 percent
Lifetime of Reused PC	3 years	3 years
% Reused Recycled	N/A	40 percent
% Reused Stockpiled	N/A	50 percent
% Reused Landfilled	N/A	10 percent
Lifetime of Stockpiled PC	3 years	3 years
% Stored Recycled	0 percent	75 percent
% Stored Landfilled	100 percent	25 percent

Table 1 - Assumptions Used in Disposition Models

Conclusions

The growth rate of the computer industry has been more dramatic than expected. Consumers are buying more portable computers than ever (20% of sales and growing). Also, more computers are being stored by users making costly decisions about disposition. Finally, electronic reclamation businesses are flourishing with a constant stream of obsolete products, thereby reducing the numbers of units going to landfills, and increasing the number available for takeback. As mandatory takeback goes into effect around the world, such reclamation activities will become strategically valuable.

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