A Bureau of Business Research Report
From the University of Nebraska–Lincoln

Estimating Demand for Business Recycling Services in Two Nebraska Cities

Final Report
Prepared for
WasteCap Nebraska and
The Nebraska Department of Environmental Quality

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Executive Summary

Creating opportunities for business recycling is an important priority for the State of Nebraska and communities throughout the state. In particular, there is a need to expand opportunities in smaller communities that do not always have the infrastructure or markets for recycling found in the state's largest cities such as Omaha and Lincoln. With this in mind, the following report, sponsored by WasteCap Nebraska and the Nebraska Department of Environmental Quality, uses a survey of businesses to evaluate business attitudes toward recycling, current recycling efforts, and the level of need and interest for recycling training and services in two mid-size Nebraska cities: Grand Island and Columbus.

Survey results, in general, tended to be very consistent from city to city. And, while survey results reflect the unique industrial make-up, existing recycling arrangements, and attitudes toward recycling found in each of the two case cities, the results also should be instructive about business attitudes and practices for recycling in other regions of the state, particularly in other mid-size Nebraska cities.

In Chapter 2 and 3 of this report, survey results are presented in aggregate and by type of industry. Results are based on a 55% survey response rate in Columbus and a 40% response rate in Grand Island, Nebraska. These are high response rates relative to the 20% to 30% response rates typically achieved in mail surveys. These high rates ensure the reliability of study results and also demonstrate significant interest among businesses on the topic of recycling.

The survey results did not differ in any clear and consistent way by type of industry, with the exception that manufacturers on average did tend to be more interested in and more likely to undertake recycling initiatives. The main differences found in the surveys instead arise between small businesses and large businesses. For example, only about one-third of small businesses find recycling and waste reduction to be important or very important versus more than half of large businesses. Large businesses also were much more likely to have a recycling or waste reduction program and recycled a wider variety of materials. Further, large businesses were much more likely to be willing to purchase equipment or pay for recycling services, though both small and large businesses were willing to devote man-hours to recycling efforts.

There was consistency between small and large businesses in some areas. Both small and large businesses showed significant interest in opportunities to recycle fluorescent bulbs and computer monitors at a reduced cost, though percentages were somewhat higher for large businesses. There was also little difference among companies regarding the general barriers to recycling, with both large and small businesses interested in reducing the time required to recycle.

Taken together, survey results suggest at least three potential approaches for local recycling efforts:

1) Provide additional information about recycling to businesses in general for the following materials: plastics, glass, fluorescent bulbs, cardboard, magazines, office paper, metals, and toner cartridges.
2) Provide increased access and information on the costs and benefits of recycling bulbs and monitors and increase options for recycling construction materials.
3) Increase access and visibility of recycling drop-off centers to businesses; communicate ease and access of facilities and all the materials that are accepted.

Chapter 1 Design and Scope of the Study

I. Introduction

Recycling and material reuse is an important waste disposal option for businesses in Nebraska. Recycling and reuse is not always possible, but is an option both for traditionally recycled materials such as paper, cardboard, glass, and plastic, as well as for a number of emerging opportunities with modern items such as computers/electronics, toner cartridges, and fluorescent bulbs.

Programs exist in Nebraska to train and assist businesses in developing recycling and reuse of materials, including local efforts such as those led by WasteCap Nebraska which delivers programs to assist businesses through training, reuse of materials, cooperative purchases, and others. Coordinated local efforts such as WasteCap Nebraska may be appropriate in additional Nebraska cities if there is sufficient demand and interest in these types of services.

WasteCap Nebraska and the Nebraska Department of Environmental Quality contracted with the University of Nebraska–Lincoln Bureau of Business Research (BBR) to gather data to evaluate business attitudes toward recycling, current recycling efforts, and the level of need and interest for recycling training and services in two Nebraska cities: Grand Island and Columbus. Both are mid-size Nebraska cities with a large manufacturing base but also a well-developed retail and service sector. Survey results from these two cities provide detailed information about the recycling activity and preferences of a wide cross-section of businesses. While survey results reflect the unique industrial make-up, existing recycling arrangements, and attitudes toward recycling found in each of the two case cities, the results also should be instructive about business attitudes and practices for recycling in other regions of the state, particularly in other mid-size Nebraska cities.

This report summarizes the results of the recycling surveys in Grand Island and Columbus. The balance of this chapter provides a detailed description of the survey design process and sampling frame, surveying strategies, and survey responses. Chapter 2 provides a detailed discussion of survey responses for Columbus. In Chapter 2, we provide a detailed discussion and analysis of survey responses to each of the 26 questions on the survey. Survey responses are presented separately for large employers (100 or more employees) and small employers (fewer than 100 employees) and are presented separately for the manufacturing, services, and retail industries. In Chapter 3, data are presented in the same way for survey responses from Grand Island. Key survey findings are summarized in Chapter 4. First, we summarize key differences in attitudes about recycling between Grand Island and Columbus and between large employers and small employers. Chapter 4 also explores trends in current recycling efforts and areas of interest, as well as the particular level of interest in waste assessments, disposal of fluorescent bulbs and computer monitors, and resource management services. Chapter 4 also discusses the barriers to recycling that were mentioned by residents in the two communities.

II. Methodology

Conducting a survey is a multi-step process that includes survey development, identification of the sampling frame, and selection of a specific sample of businesses to be surveyed. Each of these steps is described below.

A. Enhancement of Past Survey Instruments

WasteCap Nebraska has developed a series of survey instruments as part of past research efforts on the need for business recycling and training services. These survey instruments, developed by experts in the recycling field and tested through previous research, are one basis for the survey questions used in this study. The Bureau of Business Research, however, also developed a number of other questions to be included in the survey instrument. The following steps were taken in order to identify and evaluate survey questions:

- BBR held a stakeholders' meeting with persons from throughout Nebraska for the work on state and local recycling efforts (February 2005);
- BBR held some half dozen meetings with WasteCap Nebraska staff;
- BBR and WasteCap Nebraska had the survey reviewed by recycling experts from the state; and
- BBR held a pretest of the survey in Columbus, Nebraska (April 2005).

The resulting survey instrument is contained in Appendix 1 to this report.

B. Sampling Frame and Sample Development

Development of a sample of firms to survey proceeds in two steps. The first step is to develop a sampling frame, which is the total group of all firms that are identified for potential sampling. The second step is to develop the sample of firms that will be sampled. This section explains how the sampling frame was developed and the criteria for sample selection for both large and small firms.

i. Sampling Frame

The key to developing the appropriate sampling frame is to identify as large a share of businesses as possible in Columbus and Grand Island. It is difficult to identify all businesses, particularly small sole proprietorships, but we draw upon three useful sources to develop a strong list. The first is a comprehensive list of many Nebraska businesses available from Harris InfoSource.[1] This database contains all manufacturing businesses in each location in the state as well as each nonmanufacturing business with 25 or more employees. Data from Harris InfoSource drawn for Grand Island and Columbus provide a comprehensive source for manufacturing firms and a good start for a sampling frame for nonmanufacturing businesses.

The second key data source is Dunn & Bradstreet (D&B). D&B products and services are drawn from the world's largest database of its kind. D&B uses sophisticated data collection tools and update its database over one million times a day to help ensure the accuracy and completeness of its information. D&B is well-known for its reports [D&B Business Information Report (BIR) and D&B Comprehensive Report]. We draw business information for Grand Island and Columbus as well as Platte and Hall counties from this source.

Based on the above mentioned information, we picked and combined all the information for businesses listed as located in the principal zip codes of Grand Island and Columbus. We deleted information not germane to our project, but kept information such as business name, address, contact person and phone number, employment count, business type, etc. that is relevant to our research project. By combining all the useful data and adjusting data from different source into the same format, we built our original worksheet for the list of businesses in Grand Island and Columbus.

[1] Harris InfoSource publishes a directory of manufacturers for many states around the country.

Because this original worksheet contained business information from both Harris InfoSource and D&B, it necessarily has duplicate business information. Our next step was to eliminate all duplicate information. Thus, we finished constructing the preliminary sampling frame.

The preliminary sampling frame was supplemented by searching the telephone book for the two cities for businesses by industry. This is the third key source of business names and contact information. We expanded the sampling frame by including all of the other businesses in the telephone book. For businesses that were on our base list, we compared our address with that listed in the phonebook. If they were different, we changed the address to the one in the phone book. For businesses that were not on our base list, we added them and entered the address from the phonebook. In this case, we do not have additional information on contact information. If we could not confirm an address from our base list or via the internet, we deleted it from our sampling frame.

We divided our sampling frame into large and small businesses. This is done because attitudes toward recycling and recycling needs can vary between large and small businesses. We also do this in order to separately track and evaluate response rates for small versus large businesses. Segmentation means that different response rates are tracked for large and small firms and that the results for both groups are kept and analyzed separately, though it is sometimes necessary to combine the two. While there is no clear definition of what denotes a "large" business, our research includes all firms with 100 or more employees in the large business category.[2]

To evaluate our sampling frame, we compared our sampling frame (Table 1.1) with business totals for the two cities reported by the Bureau of Census (Table 1.2). To facilitate comparison, we separated the companies into different industries using the primary SIC code, i.e., business type information. Note that our sampling frame is similar for larger employers (with more than 100 employees). Our sampling frame is substantially larger in the case of small businesses (fewer than 100 employees). This difference arises because the Bureau of Census data only capture businesses with employees, but our data source will capture self-employed proprietors without employees.

Table 1.1 Bureau of Business Research Sampling Frame

City/Industry	Fewer than 100 Employees	More than 100 Employees
Grand Island		
Manufacturing	132	9
Nonmanufacturing	3,242	33
Columbus		
Manufacturing	103	7
Nonmanufacturing	1,562	14

[2] Because we do not have information on business size for the businesses that we add from the phone directory, we assume that they are all small businesses.

Table 1.2 Bureau of Census Data on Number of Businesses in Grand Island and Columbus, NE[1]

City/Industry	Fewer than 100 Employees	More than 100 Employees
Grand Island		
Manufacturing	56	10
Nonmanufacturing	1,487	32
Columbus		
Manufacturing	55	8
Nonmanufacturing	716	7

Source: Bureau of Census, 2001 County Business Patterns, Zip Codes Files (www.census.gov).
[1] Based on principal zip codes in each city.

ii. Sample Selection

The sample of large businesses is taken from the base group of businesses with 100 or more employees.

For Columbus, there are 21 large businesses. We surveyed all of these large businesses. The rest of the businesses in our sampling frame comprise the small businesses. We randomly sampled 403 of these small businesses.[3] For Grand Island, there are 42 large businesses. We surveyed all the large businesses and 750 of the small businesses.

All large businesses were sent the long-form survey instrument seen in Appendix 1. To facilitate higher response rates from small businesses, we sent a short-form survey instrument to roughly 75% of the small businesses. This short-form survey instrument (see Appendix 2) contained all the key questions from the long-form instrument (long-form Questions 1 through 15).

iii. Survey Mailings

Mail surveys were sent to businesses up to three times during the fall and early winter of 2005. In each community, roughly 15.5% of surveys had the wrong address or were currently out of business. Selected large employers were contacted a fourth time in order to encourage participation. As noted below, the response rate among active firms for which we had the correct address was roughly 55% for Columbus and roughly 40% for Grand Island.

III. Summary Statistics about Survey Responses

A. Columbus Response Rate and Weighting

In Columbus, we received 13 surveys from large companies and 185 surveys from small companies. After adjusting for the 15.5% bad addresses or firms that were out of business, small firms (and one large firm), these represent roughly a 65% response rate for large employers and a 54% response rate for small employers.[4] Both are high response rates for a mail survey and are sufficient for detailed analysis of survey responses.

[3] We assigned random numbers to each of the small businesses using Microsoft Excel and then sorted the numbers. The first 403 businesses are included in our sample.

[4] According to the returned surveys, we found that three small companies in our sample had more than 250 employees, so we moved them to the large company group. We also found that one large company in our sample had fewer than 20 employees; in a similar way, we moved it to the small company group. Due to these movements, the number of companies in each group has changed accordingly. After making all the changes, we have the following numbers, which will be used to calculate the weights for later data analysis. The total number of all small

For two of the questions in our survey, we estimated total recycling and disposal activity for all businesses in Columbus. This meant using data from all returned surveys and applying it to non-respondents and, in the case of small employers, businesses in the sampling frame of roughly 1,600 businesses that were not sampled (i.e., never sent a survey). Given the high response rates in the survey, it is appropriate to assume that the answers of survey respondents are representative of businesses that did not respond (or, in the case of small businesses, were not in the sample). Therefore, to predict community totals we weighted up data from respondents to questions 9 and 10 by a factor of 1.5 (20/13) for large employers and 7.6 (1404/185) for the small employers. Responses for the two groups were added to yield community totals.[5]

B. Grand Island Response Rate and Weighting

In Grand Island, we received 19 surveys from large companies and 240 surveys from small companies. After adjusting for 15.7% bad addresses or firms out of business for small firms (and 4 large firms), these figures represent a 50% response rate for large firms and a 38% response rate for small firms. While these figures represent lower response rates than in Columbus, the response rates are large enough that it is appropriate to assume that the answers of survey respondents are representative of businesses that did not respond (or, in the case of small businesses, were not in the sample). For Grand Island we used a similar weighting approach as in Columbus for questions 9 and 10. In particular, for Grand Island we weighted up data from respondents to questions 9 and 10 by a factor of 2.0 (38/19) for large employers and 11.9 (2844/240) for the small employers. Again, responses for the two groups were then added to yield community totals.

IV. Conclusions

The Bureau of Business Research designed a survey instrument and identified a sampling frame in order to gather detailed information about business attitudes toward recycling, current recycling efforts, and the level of need and interest for recycling training and services in Columbus and Grand Island, Nebraska. We received a strong response rate among surveyed businesses in the two communities. The following two chapters provide a detailed discussion of survey responses in the two communities.

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business in our sample frame is 1,663, and the total number of all large business in our sample frame is 21. The number of small sampled companies is 405, and the number of large sampled companies is 21.

[5] For each part of question 10, every company should fit into one of the 15 categories. Then we put its weighted number from question 9 into this category. We did this with each company and then summed all the numbers in each category to obtain the results for all parts of question 10.

Chapter 2 Columbus

Business Demographics

Question 1: Please mark the category that best describes your business

We can see from the following two charts that for small companies, most of the respondent companies are from the service and retail categories (with service accounting for 41% and retail 19%). For large respondent companies, most of the respondent companies are from the manufacturing industry category (accounting for 62%).

Figure 2.1 Business Type

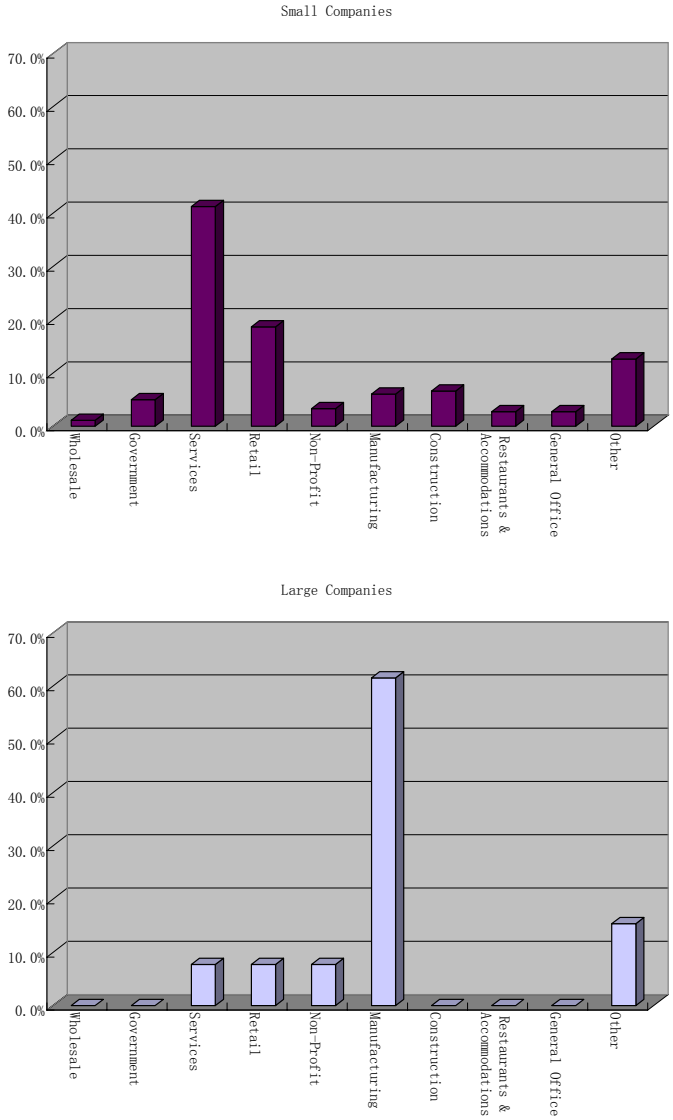


Table 2.1 Business Type

	Small	Large
Wholesale	1.1%	0.0%
Government	4.9%	0.0%
Services	41.2%	7.7%
Retail	18.7%	7.7%
Non-Profit	3.3%	7.7%
Manufacturing	6.0%	61.5%
Construction	6.6%	0.0%
Restaurants & Accommodations	2.7%	0.0%
General Office	2.7%	0.0%
Other	12.6%	15.4%

Question 2: How many people are employed by your business at your location?

Below are two charts regarding company size. For small companies, most of the respondent companies have fewer than 20 employees. For large companies, most of the respondent companies have more than 250 employees. According to the returned surveys, we found that three small companies in our sample had more than 250 employees, so we moved them to the large company group. We also found that one large company in our sample had fewer than 20 employees; in similar way, we moved it to the small company group.

Figure 2.2 Employment Count

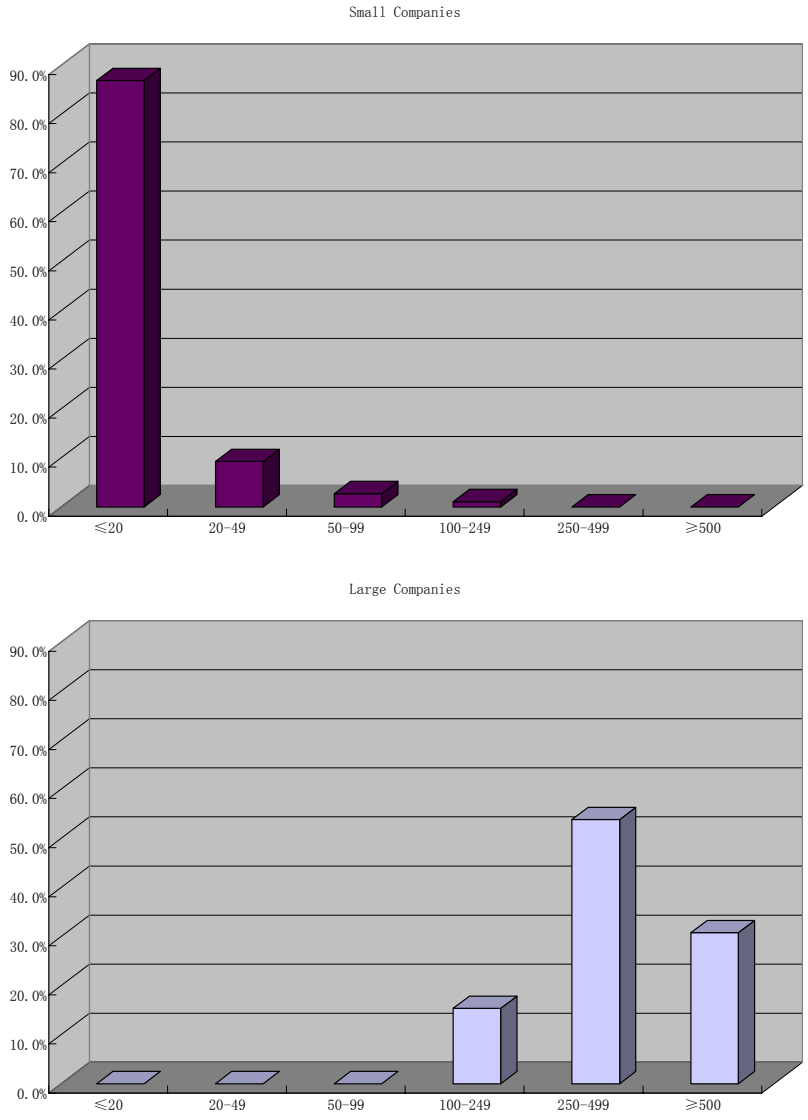


Table 2.2 Employment Count

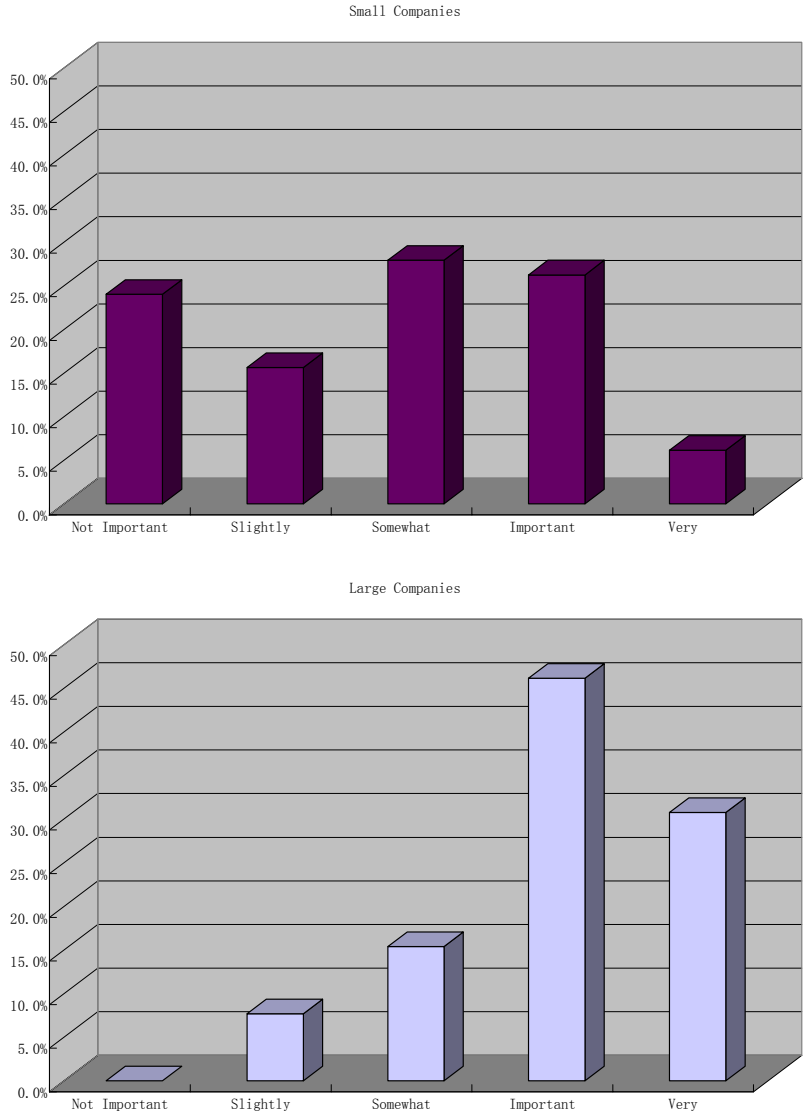
	Small	Large
≤20	86.9%	0.0%
20-49	9.3%	0.0%
50-99	2.7%	0.0%
100-249	1.1%	15.4%
250-499	0.0%	53.8%
≥500	0.0%	30.8%

Business Attitudes about Recycling

Question 3: How important is recycling and waste reduction to your business?

These two charts show us how the respondent companies see the importance of recycling to their business. For small companies, few of the respondent companies think of recycling as very important, with a share of about one-fourth saying important and 6.1% choosing very important. For large companies, 46% regard it as important and 31% chose very important.

Figure 2.3 Importance Of Recycling To The Business



We further divide all small businesses into four groups: manufacturing, retail, services, and all other. We also divide all large businesses into two groups: manufacturing and nonmanufacturing. The following table provides this information. We can see that for small businesses, only the retail and service sectors put less importance on recycling and waste reduction. For large businesses the results are even clearer; manufacturing tends to put more importance on recycling and waste reduction, while nonmanufacturing companies do not.

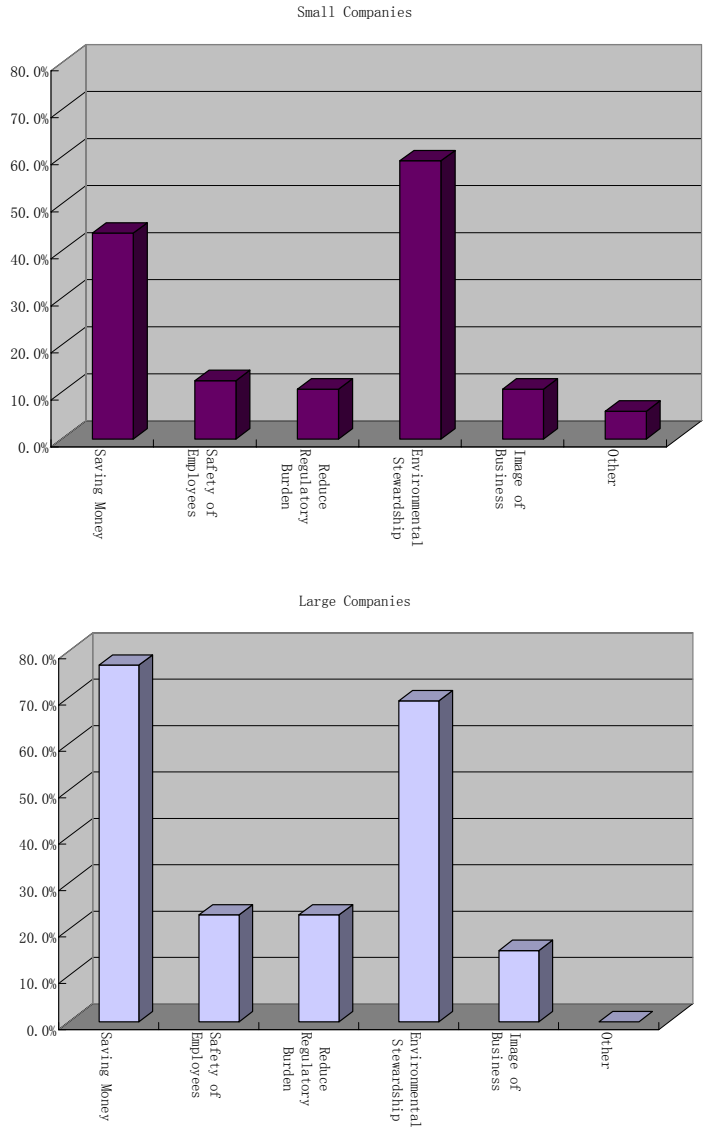
Table 2.3 Importance Of Recycling To The Business, By Business Type

	Not Important	Slightly	Somewhat	Important	Very
All Small Businesses	24.0%	15.6%	27.9%	26.3%	6.1%
Manufacturing	27.3%	9.1%	36.4%	18.2%	9.1%
Retail	25.0%	28.1%	21.9%	21.9%	3.1%
Services	33.8%	14.1%	22.5%	22.5%	7.0%
All Other	12.3%	12.3%	35.4%	33.8%	6.2%
All Large Businesses	0.0%	7.7%	15.4%	46.2%	30.8%
Manufacturing	0.0%	0.0%	0.0%	50.0%	50.0%
Nonmanufacturing	0.0%	20.0%	40.0%	40.0%	0.0%

Question 4: What would be your top priority or priorities for participating in waste reduction and/or recycling?

The following two charts show that for both small and large companies, most of the respondent companies chose saving money and environmental stewardship responses. More small companies chose environmental stewardship, while more large companies chose saving money.

Figure 2.4A Top Priorities For Participating In Waste Reduction



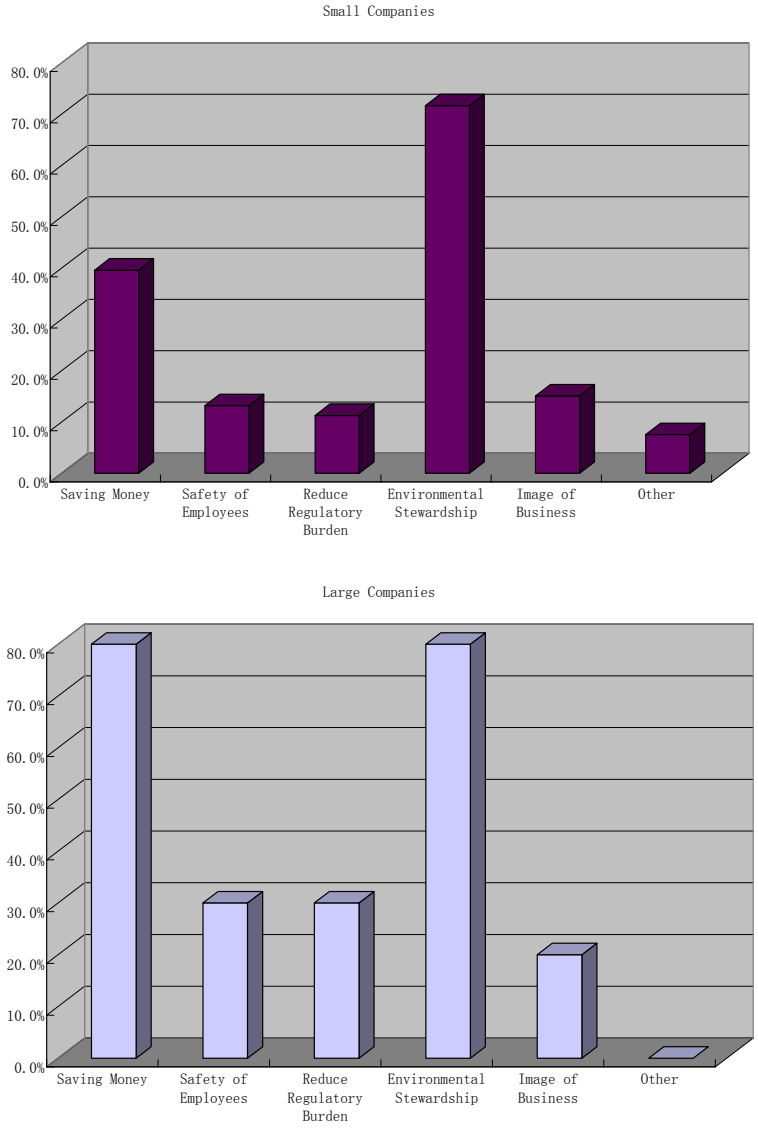
For this question, we again further divide all small businesses into four groups: manufacturing, retail, services, and all other. We divide all large businesses into two groups: manufacturing and nonmanufacturing. The results did not change much with the sub-division of groups. Most of the respondent companies still chose saving money and environmental stewardship. Slightly more small companies chose environmental stewardship, while more of large companies chose saving money. In the manufacturing sector, however, equal shares of large and small companies chose saving money and environmental stewardship.

Table 2.4 Top Priorities In Participating In Waste Reduction

	Saving Money	Safety of Employees	Reduce Regulatory Burden	Environmental Stewardship	Image of Business	Other
All Small Businesses	43.8%	12.4%	10.7%	59.2%	10.7%	5.9%
Manufacturing	80.0%	30.0%	10.0%	80.0%	20.0%	0.0%
Retail	43.8%	9.4%	12.5%	59.4%	6.3%	0.0%
Services	44.8%	13.4%	10.4%	47.8%	13.4%	0.0%
All Other	36.7%	10.0%	10.0%	68.3%	8.3%	0.0%
All Large Businesses	76.9%	23.1%	23.1%	69.2%	15.4%	0.0%
Manufacturing	75.0%	25.0%	25.0%	75.0%	12.5%	0.0%
Nonmanufacturing	80.0%	20.0%	20.0%	60.0%	20.0%	0.0%

The following two charts represent responses from companies that chose important or very important in question 3. The results did not change significantly from the previous two graphs based on all companies' responses. The share of firms choosing environmental stewardship increased for both the small company group and the large company group. The share of companies choosing environmental stewardship is equal to the share of companies choosing saving money for the large company group.

Figure 2.4B Top Priorities In Participating In Waste Reduction For Companies That Responded Important Or Very Important



Recycling Activity and Interest

Question 5: Does your business currently have a waste reduction program?

Question 6: Does your business currently have a recycling program?

Questions 5 and 6 investigate whether companies currently have waste reduction programs and recycling programs. For this question, we again further divide all small businesses into four groups: manufacturing, retail, services, and all other. We divide all large businesses into two groups: manufacturing and nonmanufacturing. The table below shows that 55% of the small respondent companies have neither of the programs, while only 23% of the large respondent companies have neither of the programs. Among the large firms, 70% had both programs, while 8% had recycling only. Among small firms, 23.5% had both programs, while 19.1% had recycling only. It was rare for firms to have a waste reduction program without a recycling program. Among small businesses, sub-divided groups still followed the same structure, except that an equal share of 46% in the manufacturing sector has neither of the programs or has both of the programs. Among large businesses in the manufacturing sector, all companies have at least one program and nearly 90% have both programs. In the nonmanufacturing sector, 40% of companies have both programs and 60% have neither of the programs.

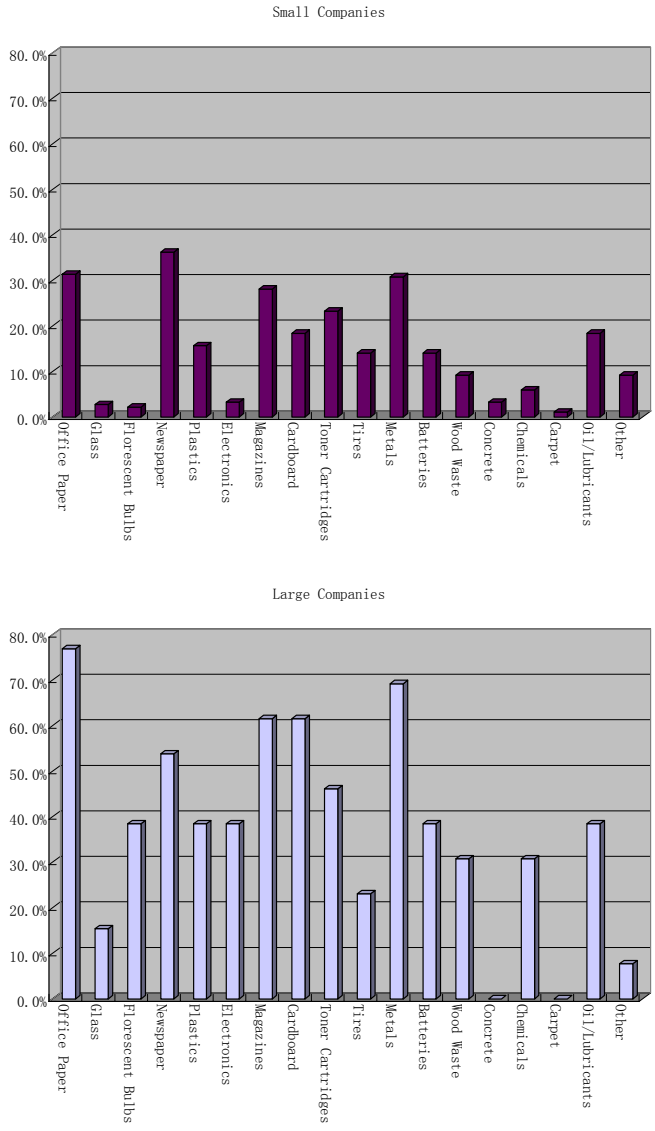
Table 2.5 Companies With Current Waste Reduction Or Recycling Programs

	None	Waste Reduction	Recycling	Both
All Small Businesses	55.2%	2.2%	19.1%	23.5%
Manufacturing	45.5%	0.0%	9.1%	45.5%
Retail	52.9%	2.9%	23.5%	20.6%
Services	61.3%	2.7%	14.7%	21.3%
All Other	52.3%	1.5%	23.1%	23.1%
All Large Businesses	23.1%	0.0%	7.7%	69.2%
Manufacturing	0.0%	0.0%	12.5%	87.5%
Nonmanufacturing	60.0%	0.0%	0.0%	40.0%

Question 7: Which of the following does your company currently recycle?

For small companies, at least 25% of respondent companies currently recycle office paper, newspaper, magazines, and metals. For large companies, at least 60% of respondent companies recycle office paper, magazines, cardboard, and metals. Only 2% of small respondent companies and 39% of large ones currently recycle fluorescent bulbs; 3% of small respondent companies and 39% of large ones currently recycle electronics. The charts seem to tell us that large companies have done better in recycling.

Figure 2.5 What Companies Currently Recycle



For this question, we also further divide all small businesses into four groups: manufacturing, retail, services, and all other. We divide all large businesses into two groups: manufacturing and nonmanufacturing. From this table, we can see that small manufacturers are more likely to recycle metals, office paper, newspaper, and oil. Large manufacturers recycle more of most materials.

Table 2.6 What Companies Currently Recycle By Industry Category

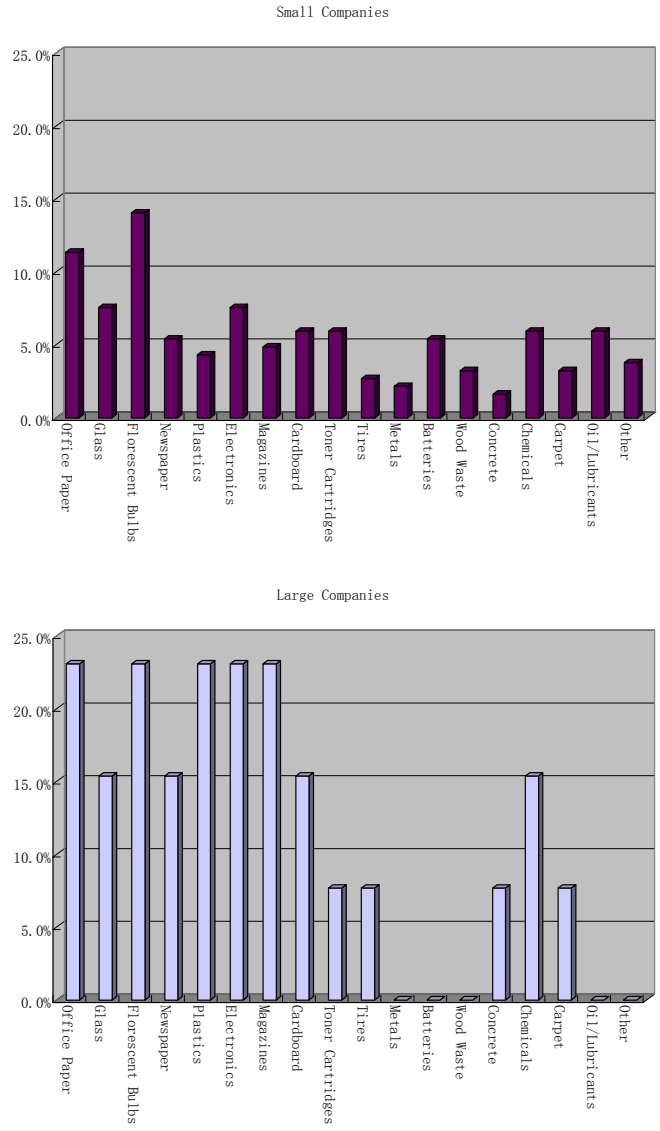
	All Small Businesses	Manufacturing	Retail	Services	All Other
Office Paper	31.4%	45.5%	20.6%	29.3%	36.9%
Glass	2.7%	0.0%	0.0%	4.0%	3.1%
Fluorescent Bulbs	2.2%	0.0%	0.0%	2.7%	3.1%
Newspaper	36.2%	36.4%	32.4%	32.0%	43.1%
Plastics	15.7%	9.1%	11.8%	9.3%	26.2%
Electronics	3.2%	0.0%	2.9%	5.3%	1.5%
Magazines	28.1%	18.2%	23.5%	25.3%	35.4%
Cardboard	18.4%	9.1%	20.6%	17.3%	20.0%
Toner Cartridges	23.2%	27.3%	14.7%	18.7%	32.3%
Tires	14.1%	9.1%	8.8%	17.3%	13.8%
Metals	30.8%	72.7%	20.6%	28.0%	32.3%
Batteries	14.1%	27.3%	14.7%	14.7%	10.8%
Wood Waste	9.2%	0.0%	2.9%	6.7%	16.9%
Concrete	3.2%	0.0%	0.0%	2.7%	6.2%
Chemicals	5.9%	9.1%	5.9%	5.3%	6.2%
Carpet	1.1%	0.0%	0.0%	0.0%	3.1%
Oil/Lubricants	18.4%	36.4%	14.7%	16.0%	20.0%
Other	9.2%	0.0%	0.0%	0.0%	0.0%

	All Large Businesses	Manufacturing	Nonmanufacturing
Office Paper	76.9%	100.0%	40.0%
Glass	15.4%	25.0%	0.0%
Fluorescent Bulbs	38.5%	50.0%	20.0%
Newspaper	53.8%	62.5%	40.0%
Plastics	38.5%	62.5%	0.0%
Electronics	38.5%	50.0%	20.0%
Magazines	61.5%	87.5%	20.0%
Cardboard	61.5%	87.5%	20.0%
Toner Cartridges	46.2%	75.0%	0.0%
Tires	23.1%	25.0%	20.0%
Metals	69.2%	100.0%	20.0%
Batteries	38.5%	50.0%	20.0%
Wood Waste	30.8%	50.0%	0.0%
Concrete	0.0%	0.0%	0.0%
Chemicals	30.8%	37.5%	20.0%
Carpet	0.0%	0.0%	0.0%
Oil/Lubricants	38.5%	62.5%	0.0%
Other	7.7%	0.0%	0.0%

Question 8: For which materials would you like more information about recycling?

We can see from the following two charts that small companies did show strong demand for information about recycling, information about recycling fluorescent bulbs (14% of companies). 8% of the companies need information about recycling electronics. For large companies, 23% of respondent companies need information about recycling office paper, glass, fluorescent bulbs, plastics, electronics, and magazines. The exact share in fluorescent bulbs and electronics for large companies is 21%. The charts show that large companies have stronger needs for information about recycling.

Figure 2.6 What Recycling Information Companies Need



For this question, we also further divide all small businesses into four groups: manufacturing, retail, services, and all other. We divide all large businesses into two groups: manufacturing and nonmanufacturing. This table shows the companies' need for information in recycling different materials differs across sectors.

Table 2.7 What Recycling Information Companies Need, By Business Category

	All Small Businesses	Manufacturing	Retail	Services	All Other
Office Paper	11.4%	9.1%	5.9%	14.7%	10.8%
Glass	7.6%	0.0%	11.8%	5.3%	9.2%
Fluorescent Bulbs	14.1%	18.2%	14.7%	8.0%	20.0%
Newspaper	5.4%	0.0%	5.9%	4.0%	7.7%
Plastics	4.3%	9.1%	0.0%	4.0%	6.2%
Electronics	7.6%	9.1%	2.9%	8.0%	9.2%
Magazines	4.9%	0.0%	2.9%	5.3%	6.2%
Cardboard	5.9%	9.1%	11.8%	2.7%	6.2%
Toner Cartridges	5.9%	9.1%	5.9%	2.7%	9.2%
Tires	2.7%	0.0%	2.9%	4.0%	1.5%
Metals	2.2%	18.2%	0.0%	1.3%	1.5%
Batteries	5.4%	0.0%	5.9%	6.7%	4.6%
Wood Waste	3.2%	9.1%	5.9%	1.3%	3.1%
Concrete	1.6%	0.0%	2.9%	1.3%	1.5%
Chemicals	5.9%	9.1%	5.9%	5.3%	6.2%
Carpet	3.2%	0.0%	0.0%	4.0%	4.6%
Oil/Lubricants	5.9%	27.3%	8.8%	1.3%	6.2%
Other	3.8%	0.0%	0.0%	0.0%	0.0%

	All Large Businesses	Manufacturing	Nonmanufacturing
Office Paper	23.1%	25.0%	20.0%
Glass	15.4%	25.0%	0.0%
Fluorescent Bulbs	23.1%	25.0%	20.0%
Newspaper	15.4%	25.0%	0.0%
Plastics	23.1%	37.5%	0.0%
Electronics	23.1%	37.5%	0.0%
Magazines	23.1%	37.5%	0.0%
Cardboard	15.4%	12.5%	20.0%
Toner Cartridges	7.7%	0.0%	20.0%
Tires	7.7%	12.5%	0.0%
Metals	0.0%	0.0%	0.0%
Batteries	0.0%	0.0%	0.0%
Wood Waste	0.0%	0.0%	0.0%
Concrete	7.7%	12.5%	0.0%
Chemicals	15.4%	12.5%	20.0%
Carpet	7.7%	0.0%	20.0%
Oil/Lubricants	0.0%	0.0%	0.0%
Other	0.0%	0.0%	0.0%

Question 9: Please estimate how many of the following are in use at your company and how many you anticipate disposing in the next 12 months.

We pooled the 198 responding companies and applied those results to the approximately 1,400 businesses we identified in Columbus to predict totals for the community. About 15,000 computers are being used, while 3,000 will be disposed in the next 12 months. Some 12,500 monitors/TVs are being used, and 2,100 will be disposed in the next year.

Table 2.8 Equipment In Use And Estimated Disposal Needs

	Number Currently in Use	Number You Anticipate Disposing Within Next 12 Months
All		
Computers	14,800	3,100
Monitors/TVs	12,500	2,100
Printer/Fax	6,900	700
Copier	2,200	100
Telephones	12,000	500
Cell Phones	2,900	500
Handheld Electronics	1,400	300
Manufacturing		
Computers	2,500	300
Monitors/TVs	2,100	300
Printer/Fax	1,000	100
Copier	500	0
Telephones	2,700	100
Cell Phones	500	0
Handheld Electronics	100	0
Nonmanufacturing		
Computers	12,300	2,800
Monitors/TVs	10,400	1,800
Printer/Fax	5,900	600
Copier	1,700	100
Telephones	9,300	400
Cell Phones	2,400	500
Handheld Electronics	1,300	300

Question 10: How do you currently dispose of those items?

The following table provides complete information for the question. We can infer that computers and monitors/TVs are usually disposed by recycling and using some other way, by recycling and giving to employees, or by recycling only. Printer/fax, telephones, and cell phones are usually disposed by using other ways or by recycling and giving to employees.

Table 2.9 Current Disposal/Recycling Methods

	Computers	Monitors/ TVs	Printer Fax	Copier	Phones	Cell Phones	Handheld Electronics
All							
Recycling	442	124	29	8	0	15	2
Donate	311	286	57	21	18	21	29
Employees	93	69	22	0	0	14	0
Others	193	164	207	36	186	129	221
Recycling+Donate	96	7	0	0	0	0	0
Recycling+Employees	1,240	741	240	12	240	240	0
Recycling+Others	536	536	0	0	0	0	0
Donate+Employees	77	71	7	0	0	0	0
Donate+Others	0	0	0	0	0	14	0
Employees+Others	9	9	9	0	0	0	0
Recycling+Donate+Employees	0	0	0	0	0	0	0
Recycling+Donate+Others	36	0	36	0	0	0	0
Recycling+Employees+Others	0	0	0	0	0	0	0
Donate+Employees+Others	0	0	0	0	0	0	0
Recycling+Donate+Employees+Others	0	0	0	0	0	0	0
Not Specified	106	126	43	14	72	57	0
Manufacturing							
Recycling	75	105	15	1	0	15	2
Donate	147	158	0	0	4	0	0
Employees	0	0	0	0	0	0	0
Others	64	64	57	0	33	0	0
Recycling+Donate	0	0	0	0	0	0	0
Recycling+Employees	18	0	0	0	0	0	0
Recycling+Others	0	0	0	0	0	0	0
Donate+Employees	20	0	0	0	0	0	0
Donate+Others	0	0	0	0	0	0	0
Employees+Others	9	9	9	0	0	0	0
Recycling+Donate+Employees	0	0	0	0	0	0	0
Recycling+Donate+Others	0	0	0	0	0	0	0
Recycling+Employees+Others	0	0	0	0	0	0	0
Donate+Employees+Others	0	0	0	0	0	0	0
Recycling+Donate+Employees+Others	0	0	0	0	0	0	0
Not Specified	6	12	0	0	36	0	0

Table 2.9 (continued) Current Disposal/Recycling Methods

	Computers	Monitors/ TVs	Printer Fax	Copier	Phones	Cell Phones	Handheld Electronics
Nonmanufacturing							
Recycling	367	19	14	7	0	0	0
Donate	164	129	57	21	14	21	29
Employees	93	69	22	0	0	14	0
Others	129	100	150	36	153	129	221
Recycling+Donate	96	7	0	0	0	0	0
Recycling+Employees	1,221	741	240	12	240	240	0
Recycling+Others	536	536	0	0	0	0	0
Donate+Employees	57	71	7	0	0	0	0
Donate+Others	0	0	0	0	0	14	0
Employees+Others	0	0	0	0	0	0	0
Recycling+Donate+Employees	0	0	0	0	0	0	0
Recycling+Donate+Others	36	0	36	0	0	0	0
Recycling+Employees+Others	0	0	0	0	0	0	0
Donate+Employees+Others	0	0	0	0	0	0	0
Recycling+Donate+Employees+Others	0	0	0	0	0	0	0
Not Specified	100	114	43	14	36	57	0

Question 11: Is your company willing to get involved in recycling if it will require: (a) spending money for equipment (b) spending money for recycling fees (c) employee (or your own) man-hours?

For part (a) and (b) questions, most of the small companies answered no, while most of the large companies answered yes or not sure. For small business, more of the manufacturing companies tend to answer not sure, while more of the other companies tend to answer no. For large business, more manufacturing companies tend to answer yes, while more nonmanufacturing companies tend to answer not sure.

For part (c) question, 35% of the small companies answered no, while 17% of large companies answered no. Results from the sub-division analysis are similar to those from question (a) and (b).

Companies tend to be more willing to devote man-hours instead of spending money to get involved in recycling.

Figure 2.7A Company Is Willing To Get Involved In Recycling If It Will Require Spending Money For Equipment

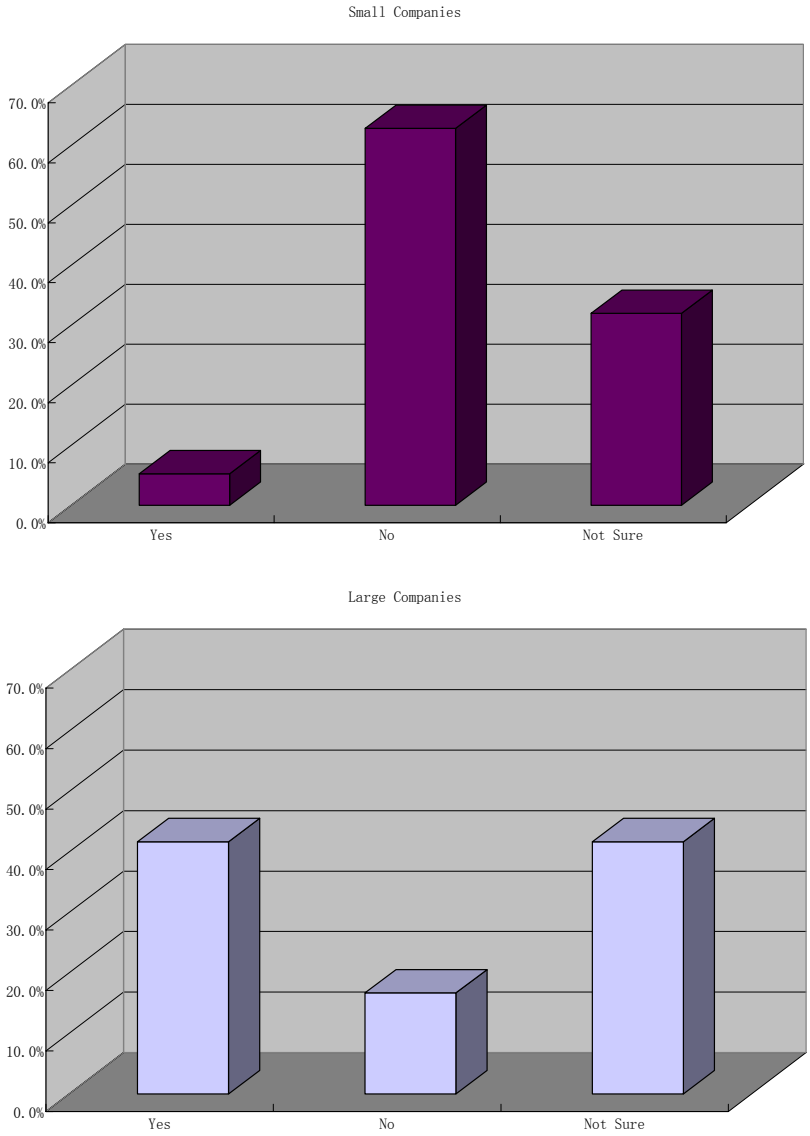


Table 2.10A Company Is Willing To Get Involved In Recycling If It Will Require Spending Money For Equipment

	Yes	No	Not Sure
All Small Businesses	5.2%	62.8%	32.0%
Manufacturing	18.2%	27.3%	54.5%
Retail	0.0%	71.0%	29.0%
Services	5.6%	66.7%	27.8%
All Other	5.2%	60.3%	34.5%
All Large Businesses	41.7%	16.7%	41.7%
Manufacturing	71.4%	14.3%	14.3%
Nonmanufacturing	0.0%	20.0%	80.0%

Figure 2.7B Company Is Willing To Get Involved In Recycling If It Will Require Spending Money For Recycling Fees

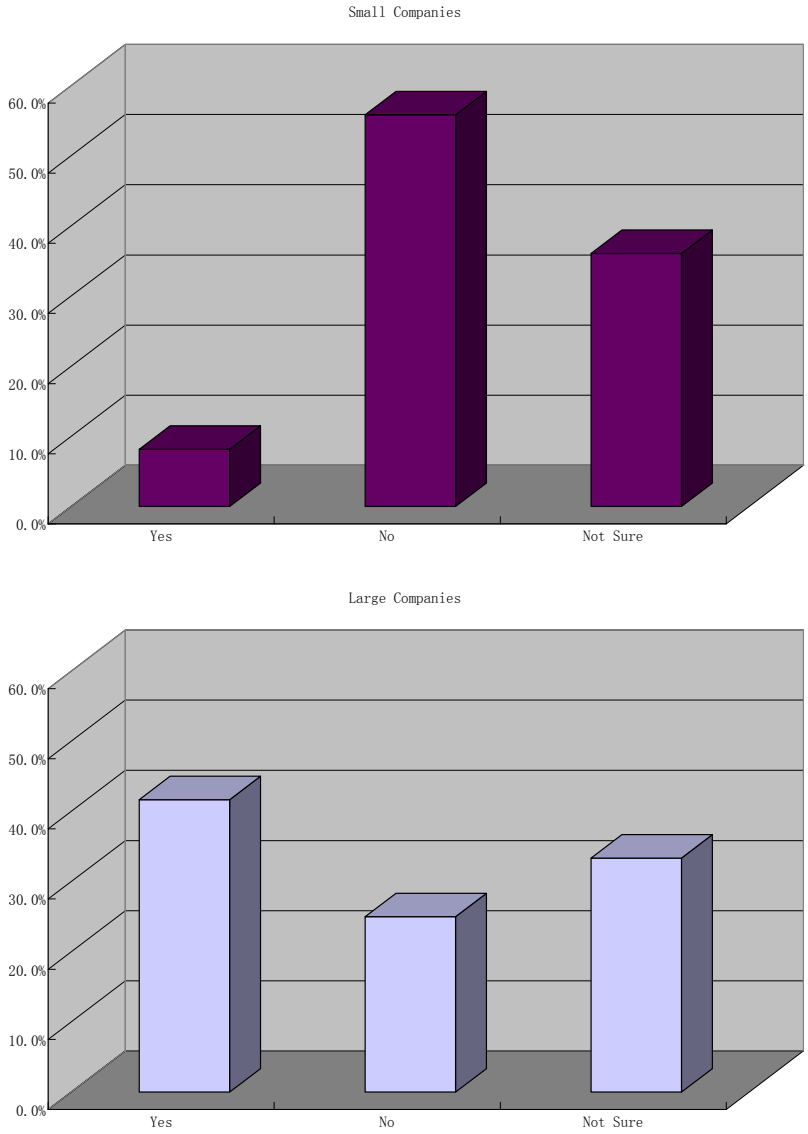


Table 2.10B Company Is Willing To Get Involved In Recycling If It Will Require Spending Money For Recycling Fees

	Yes	No	Not Sure
All Small Businesses	8.1%	55.8%	36.0%
Manufacturing	9.1%	36.4%	54.5%
Retail	3.2%	71.0%	25.8%
Services	8.5%	59.2%	32.4%
All Other	10.2%	47.5%	42.4%
All Large Businesses	41.7%	25.0%	33.3%
Manufacturing	71.4%	28.6%	0.0%
Nonmanufacturing	0.0%	20.0%	80.0%

Figure 2.7C Company Is Willing To Get Involved In Recycling If It Will Require Employee (Or Your Own) Man-Hours?

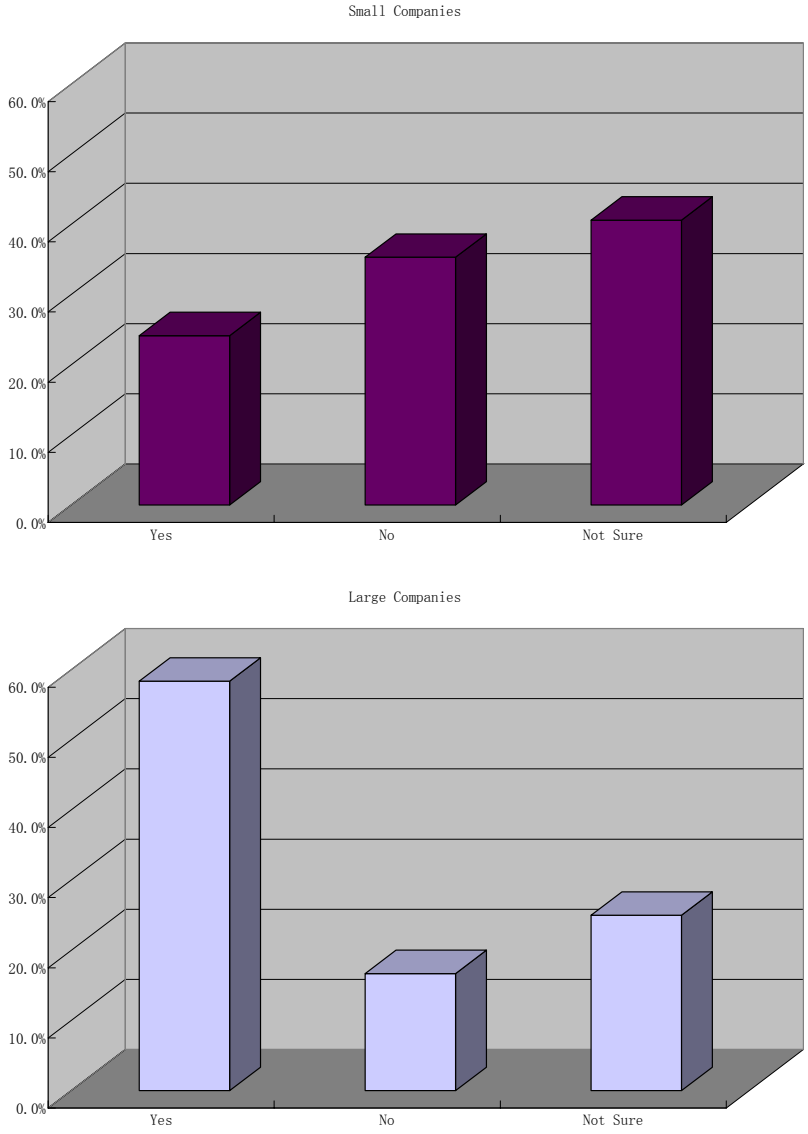


Table 2.10C Company Is Willing To Get Involved In Recycling If It Will Require Employee (Or Your Own) Man-Hours

	Yes	No	Not Sure
All Small Businesses	24.1%	35.3%	40.6%
Manufacturing	27.3%	9.1%	63.6%
Retail	28.1%	40.6%	31.3%
Services	21.4%	44.3%	34.3%
All Other	24.6%	26.3%	49.1%
All Large Businesses	58.3%	16.7%	25.0%
Manufacturing	85.7%	14.3%	0.0%
Nonmanufacturing	20.0%	20.0%	60.0%

Question 12: An on-site waste assessment is a one-time evaluation to determine opportunities for waste reduction and recycling. Would you be interested in a no-cost, confidential waste assessment?

Most of the answers from small companies are negative. The share of large companies for each choice is the same, except for the share answering very likely which is slightly smaller than others. Manufacturing companies tend to answer more positively than do other companies.

Figure 2.8 Interest In A No-Cost Confidential Waste Assessment

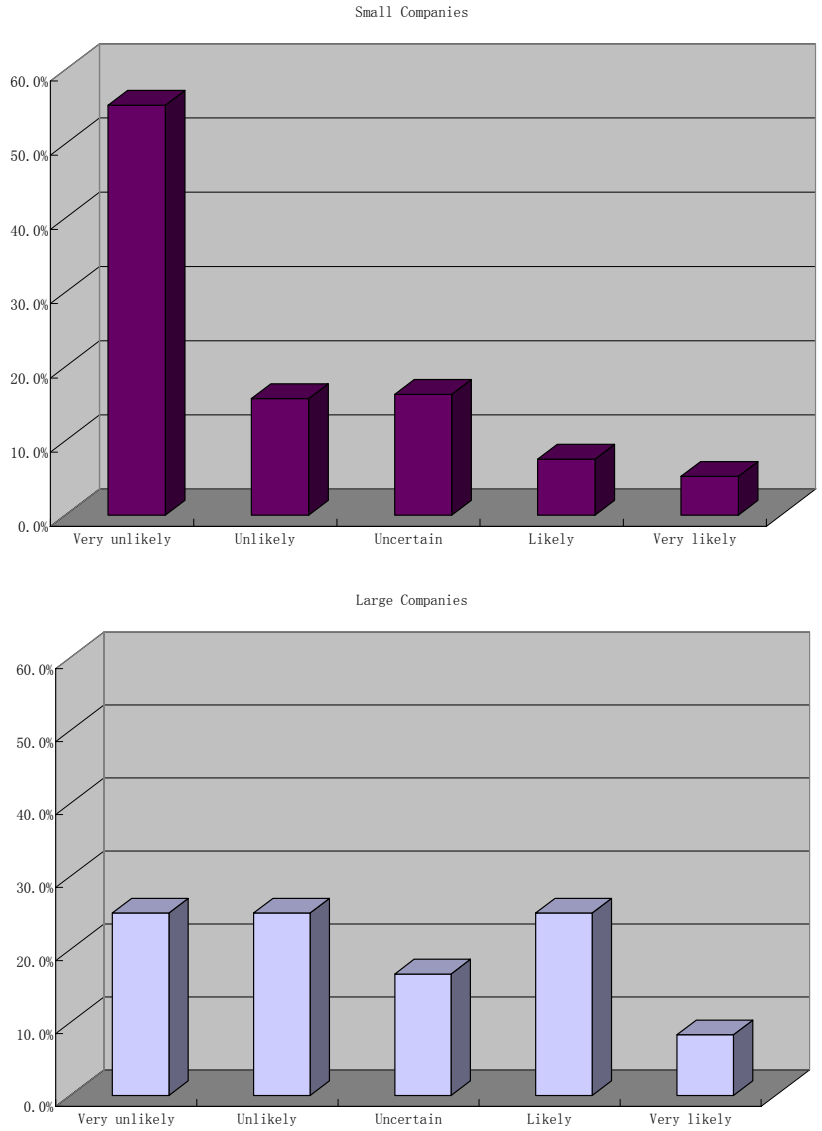


Table 2.11 Interest In A No-Cost Confidential Waste Assessment

	Very Unlikely	Unlikely	Uncertain	Likely	Very Likely
All Small Businesses	55.2%	15.7%	16.3%	7.6%	5.2%
Manufacturing	18.2%	36.4%	18.2%	18.2%	9.1%
Retail	43.3%	16.7%	26.7%	3.3%	10.0%
Services	64.4%	9.6%	17.8%	5.5%	2.7%
All Other	56.9%	19.0%	8.6%	10.3%	5.2%
All Large Businesses	25.0%	25.0%	16.7%	25.0%	8.3%
Manufacturing	14.3%	28.6%	14.3%	28.6%	14.3%
Nonmanufacturing	40.0%	20.0%	20.0%	20.0%	0.0%

Question 13: If you were to have an on-site waste assessment, for which of the following topics would you request assistance?

A majority of companies chose conducting energy efficiency studies, disposing of electronic equipment, recycling specific material/class, or setting up/improving waste program. There is a difference between small and large business; more small companies chose disposing of electronic equipment or recycling specific material/class, while most large companies chose recycling specific material/class or setting up/improving the waste program. More small manufacturing companies chose conducting energy efficiency studies or recycling specific material/class. More large manufacturing companies chose recycling specific material/class or setting up/improving waste program.

Figure 2.9 Topics Of Interest For On-Site Waste Assessment

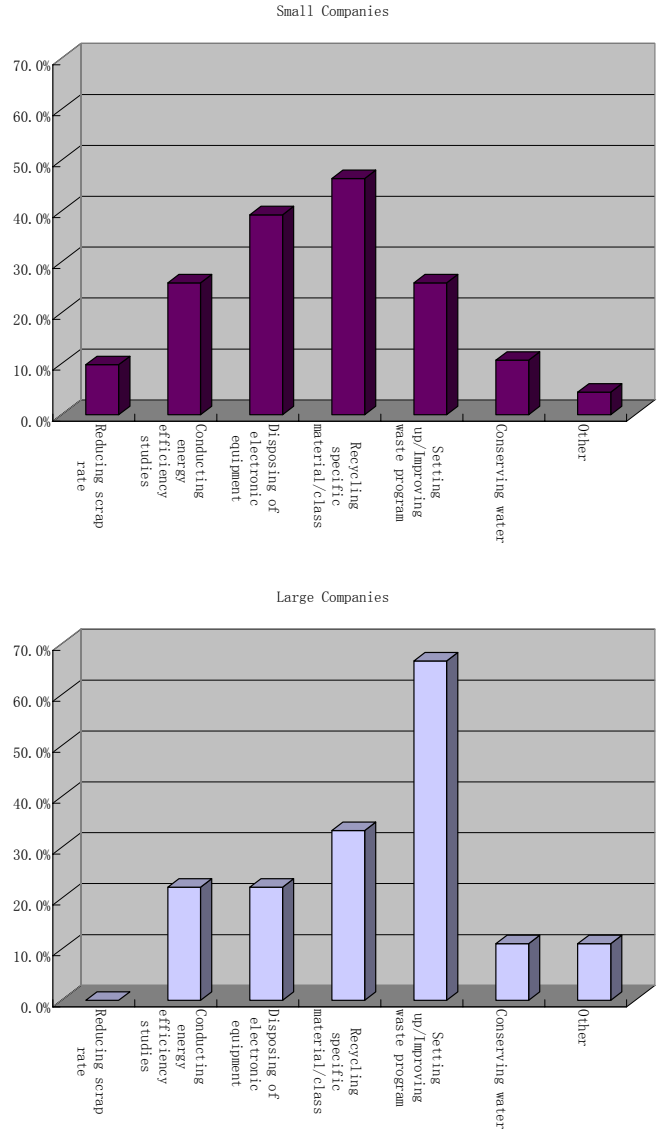


Table 2.12 Topics Of Interest For On-Site Waste Assessment

	Reducing Scrap Rate	Conducting Energy Efficiency Studies	Disposing of Electronic Equipment	Recycling Specific Material/ Class	Setting up/ Improving Waste Program	Conserving Water	Other
All Small Businesses	9.8%	25.9%	39.3%	46.4%	25.9%	10.7%	4.5%
Manufacturing	12.5%	50.0%	12.5%	50.0%	12.5%	0.0%	0.0%
Retail	9.1%	27.3%	40.9%	36.4%	40.9%	4.5%	0.0%
Services	8.9%	17.8%	42.2%	46.7%	24.4%	8.9%	0.0%
All Other	10.8%	29.7%	40.5%	51.4%	21.6%	18.9%	2.7%
All Large Businesses	0.0%	22.2%	22.2%	33.3%	66.7%	11.1%	11.1%
Manufacturing	0.0%	20.0%	20.0%	40.0%	80.0%	20.0%	0.0%
Nonmanufacturing	0.0%	25.0%	25.0%	25.0%	50.0%	0.0%	25.0%

Question 14: It can cost $10-$15 per monitor and close to $0.60 per service and all other bulb to recycle. Are you willing to pay this amount to dispose of monitors and fluorescent bulbs properly?

More small companies tend to answer negatively to this question, while large companies tend to answer positively. More specifically, 38% of small companies chose very unlikely and 4% chose very likely in response to this query. Some 17% of large companies chose very unlikely and 42% chose very likely. More than half of manufacturing companies in the small business group answer uncertain. In the large business cohort, more than half of manufacturing companies answer very likely.

Figure 2.10 Willingness To Pay For Disposal Of Monitors And Bulbs

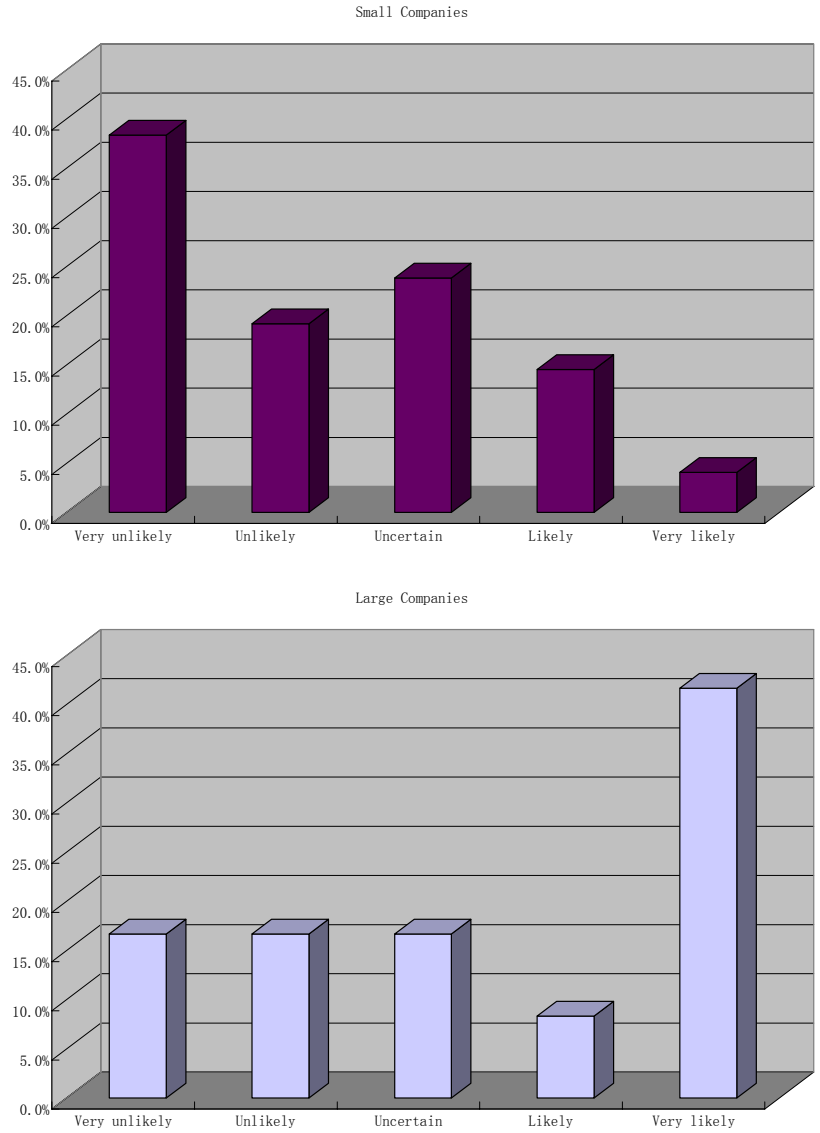


Table 2.13 Willingness To Pay For Disposal Of Monitors And Bulbs

	Very Unlikely	Unlikely	Uncertain	Likely	Very Likely
All Small Businesses	38.4%	19.2%	23.8%	14.5%	4.1%
Manufacturing	30.0%	0.0%	60.0%	10.0%	0.0%
Retail	29.0%	25.8%	25.8%	19.4%	0.0%
Services	51.4%	16.7%	15.3%	9.7%	6.9%
All Other	28.8%	22.0%	27.1%	18.6%	3.4%
All Large Businesses	16.7%	16.7%	16.7%	8.3%	41.7%
Manufacturing	14.3%	14.3%	0.0%	14.3%	57.1%
Nonmanufacturing	20.0%	20.0%	40.0%	0.0%	20.0%

Question 15: Resource management is an ongoing consulting service that helps businesses save money by reducing waste and lowering garbage hauling fee. Would you be interested in paying for this service if it cost $XXX for one year of service?

Table 2.14 Likelihood Of Being Willing To Pay For A Certain Amount Of Money As A Function Of Cost

	# Of Surveys	# Say Yes	% Say Yes
$500	29	3	10.3%
$1000	39	1	2.6%
$2000	39	1	2.6%
$3000	50	0	0.0%
$5000	28	0	0.0%

Question 16: Which technical skills would you want in an assessor?

At least 46% of the small companies and at least 77% of the large companies want an assessor with economic and environmental skills. More small companies need environmental skills, while more large companies need economic skills. About 85% of the large manufacturing companies want an assessor with economic skills and environmental skills, while all small manufacturing companies want an assessor with regulatory skills and hazardous materials and environmental skills.

Figure 2.11 Technical Assessor Skills Wanted

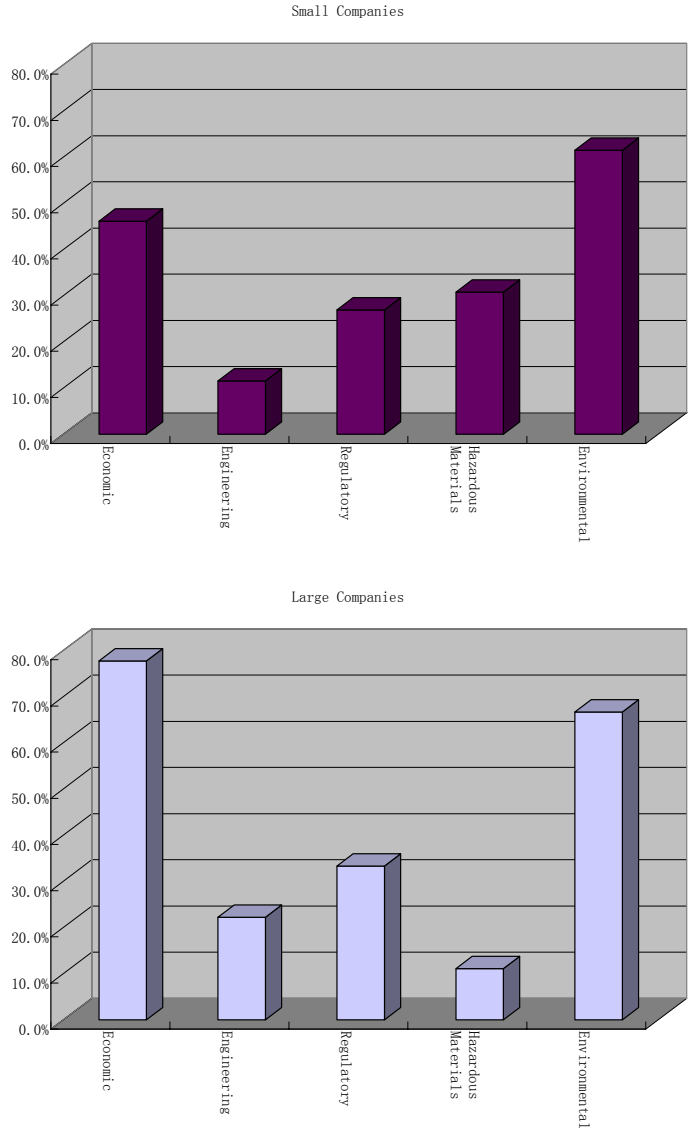


Table 2.15 Technical Assessor Skills Wanted

	Economic	Engineering	Regulatory	Hazardous Materials	Environmental
All Small Businesses	46.2%	11.5%	26.9%	30.8%	61.5%
Manufacturing	0.0%	0.0%	100.0%	100.0%	100.0%
Retail	50.0%	16.7%	16.7%	33.3%	50.0%
Services	45.5%	9.1%	27.3%	18.2%	54.5%
All Other	57.1%	14.3%	14.3%	28.6%	71.4%
All Large Businesses	77.8%	22.2%	33.3%	11.1%	66.7%
Manufacturing	83.3%	33.3%	33.3%	16.7%	83.3%
Nonmanufacturing	66.7%	0.0%	33.3%	0.0%	33.3%

Question 17: If your community had a storage facility or drop-off site for recyclable materials (beyond what is generally available for households), would you utilize it?

This question is positively answered regardless of company size. All small manufacturing companies chose either likely or very likely, while 25% of large manufacturing companies chose very likely, 38% chose likely, and 38% chose uncertain.

Figure 2.12 Willingness To Use Industrial Storage Facility Or Drop-Off Site

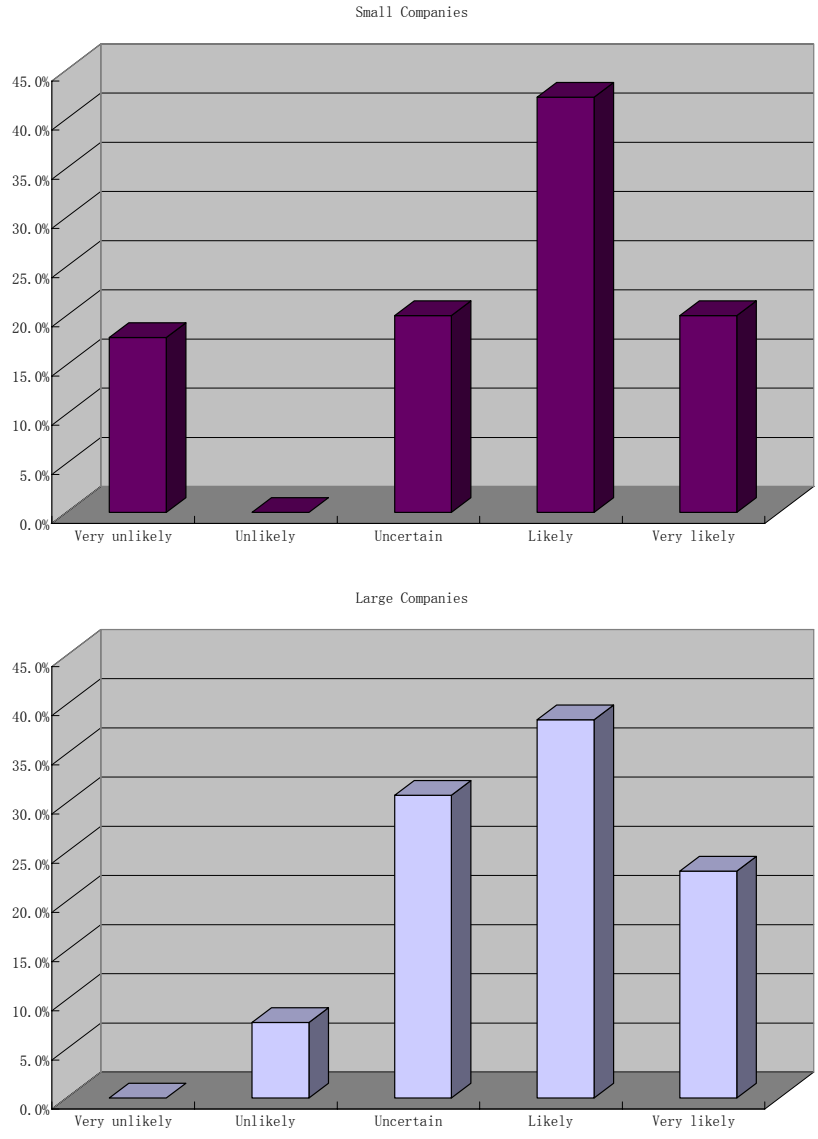


Table 2.16 Willingness To Use Industrial Storage Facility Or Drop-Off Site

	Very Unlikely	Unlikely	Uncertain	Likely	Very Likely
All Small Businesses	17.8%	0.0%	20.0%	42.2%	20.0%
Manufacturing	0.0%	0.0%	0.0%	66.7%	33.3%
Retail	10.0%	0.0%	10.0%	60.0%	20.0%
Services	26.3%	0.0%	36.8%	21.1%	15.8%
All Other	15.4%	0.0%	7.7%	53.8%	23.1%
All Large Businesses	0.0%	7.7%	30.8%	38.5%	23.1%
Manufacturing	0.0%	0.0%	37.5%	37.5%	25.0%
Nonmanufacturing	0.0%	20.0%	20.0%	40.0%	20.0%

Question 18: Who is responsible for recycling and waste management at your business?

The person who received the survey form is responsible for recycling and waste management for most of the companies regardless of company size. The responses in all groups but the small manufacturing subdivision are similar. Responses are split evenly among the three choices.

Figure 2.13 Person Responsible For Recycling And Waste Management

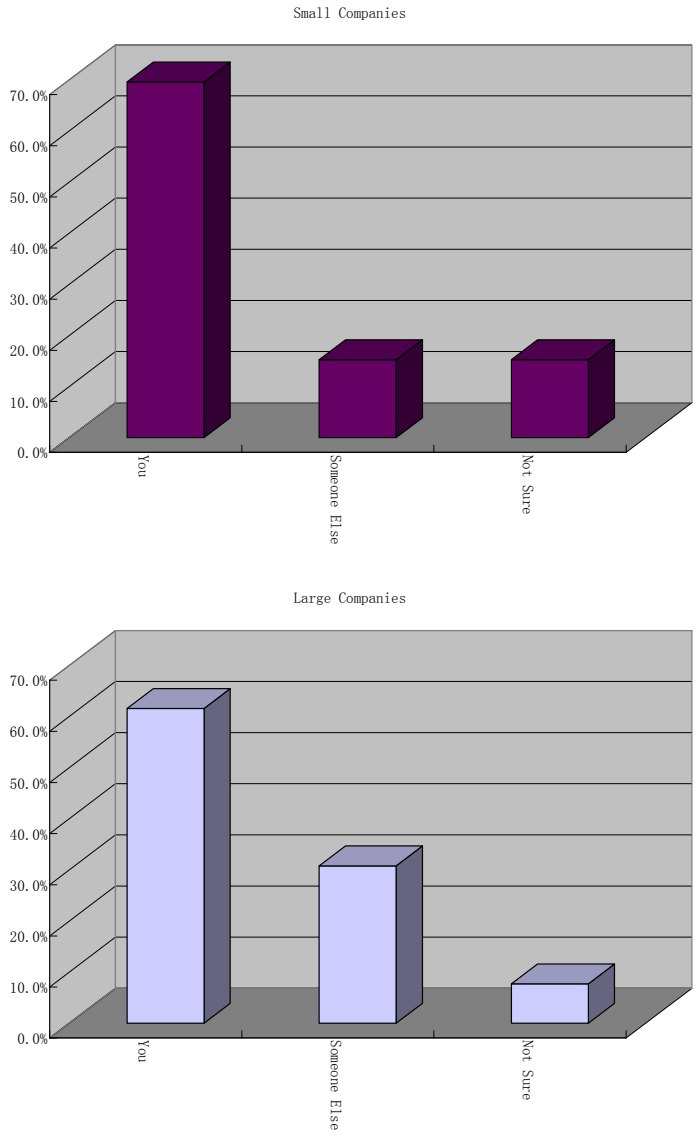


Table 2.17 Person Responsible For Recycling And Waste Management

	You	Someone Else	Not Sure
All Small Businesses	69.6%	15.2%	15.2%
Manufacturing	33.3%	33.3%	33.3%
Retail	80.0%	20.0%	0.0%
Services	84.2%	5.3%	10.5%
All Other	50.0%	21.4%	28.6%
All Large Businesses	61.5%	30.8%	7.7%
Manufacturing	75.0%	25.0%	0.0%
Nonmanufacturing	40.0%	40.0%	20.0%

Question 19: Where do you get information when making recycling and waste reduction decisions?

More of the small companies get information from local government or trash hauler. Most of the large companies get information from local government, the internet, or other businesses. The responses do not vary across the subdivisions.

Figure 2.14 Recycling And Waste Reduction Information Sources

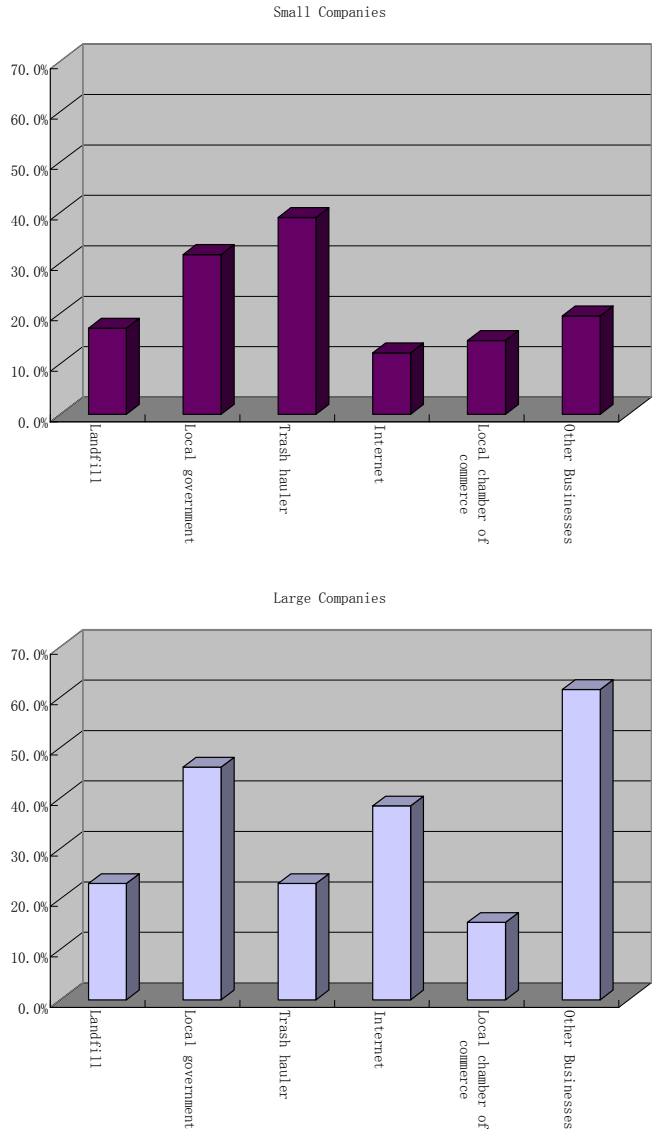


Table 2.18 Recycling And Waste Reduction Information Sources

	Landfill	Local Government	Trash Hauler	Internet	Local Chamber of Commerce	Other Businesses
All Small Businesses	17.1%	31.7%	39.0%	12.2%	14.6%	19.5%
Manufacturing	33.3%	66.7%	33.3%	33.3%	0.0%	0.0%
Retail	0.0%	55.6%	44.4%	0.0%	0.0%	22.2%
Services	18.1%	25.0%	37.5%	6.3%	25.0%	12.5%
All Other	23.1%	15.4%	38.5%	23.1%	15.4%	30.8%
All Large Businesses	23.1%	46.2%	23.1%	38.5%	15.4%	61.5%
Manufacturing	12.5%	50.0%	12.5%	50.0%	12.5%	75.0%
Nonmanufacturing	40.0%	40.0%	40.0%	20.0%	20.0%	40.0%

Question 20: Do your customers ask about your involvement in the following programs? (a) waste reduction (b) recycling

For small businesses 89% the companies answer that their customers ask about their involvement in neither of the programs. For large business, 69% of the companies were asked about neither of the programs, and 31% of the companies were asked about both. About 38% of large manufacturing companies were asked both, and 63% were asked neither. None of the small manufacturing companies were asked about either of the programs.

Table 2.19 Customers' Concern With Recycling Or Waste Reduction Efforts

	None	Waste Reduction	Recycling	Both
All Small Businesses	88.9%	0.0%	2.2%	8.9%
Manufacturing	100.0%	0.0%	0.0%	0.0%
Retail	90.0%	0.0%	10.0%	0.0%
Services	89.5%	0.0%	0.0%	10.5%
All Other	84.6%	0.0%	0.0%	15.4%
All Large Businesses	69.2%	0.0%	0.0%	30.8%
Manufacturing	62.5%	0.0%	0.0%	37.5%
Nonmanufacturing	80.0%	0.0%	0.0%	20.0%

Question 21: Do you promote your involvement in the following programs to your customers? (a) waste reduction (b) recycling

78% of the small companies promote neither of the programs. For large business, 54% of the companies promote neither of the programs and 39% of the companies promote both. None of the small manufacturing firms promoted either waste reduction or recycling. 38% of large manufacturing companies promote both, and another 50% promote neither.

Table 2.20 Customer Promotion Of Recycling Or Waste Reduction

	None	Waste Reduction	Recycling	Both
All Small Businesses	78.3%	0.0%	8.7%	13.0%
Manufacturing	100.0%	0.0%	0.0%	0.0%
Retail	80.0%	0.0%	10.0%	10.0%
Services	78.9%	0.0%	10.5%	10.5%
All Other	71.4%	0.0%	7.1%	21.4%
All Large Businesses	53.8%	0.0%	7.7%	38.5%
Manufacturing	50.0%	0.0%	12.5%	37.5%
Nonmanufacturing	60.0%	0.0%	0.0%	40.0%

Question 22: Does your business already have the following equipment that is frequently used in recycling? (a) a loading dock; (b) a fork lift; (c) a baler?

Most of the small companies don't have a loading dock, while most of the large companies do have a dock. Most of the manufacturing companies have such equipment, especially large manufacturing companies (where all have it.). Most of the small companies don't have a fork lift, but most of the large companies have fork lifts. All manufacturing companies have such equipment, regardless of company size. Most of the companies, especially the small companies, don't have a baler. Two-thirds of large manufacturing have such equipment, while none of the small manufacturers do.

Figure 2.15A Business Has Equipment Frequently Used In Recycling: Loading Dock

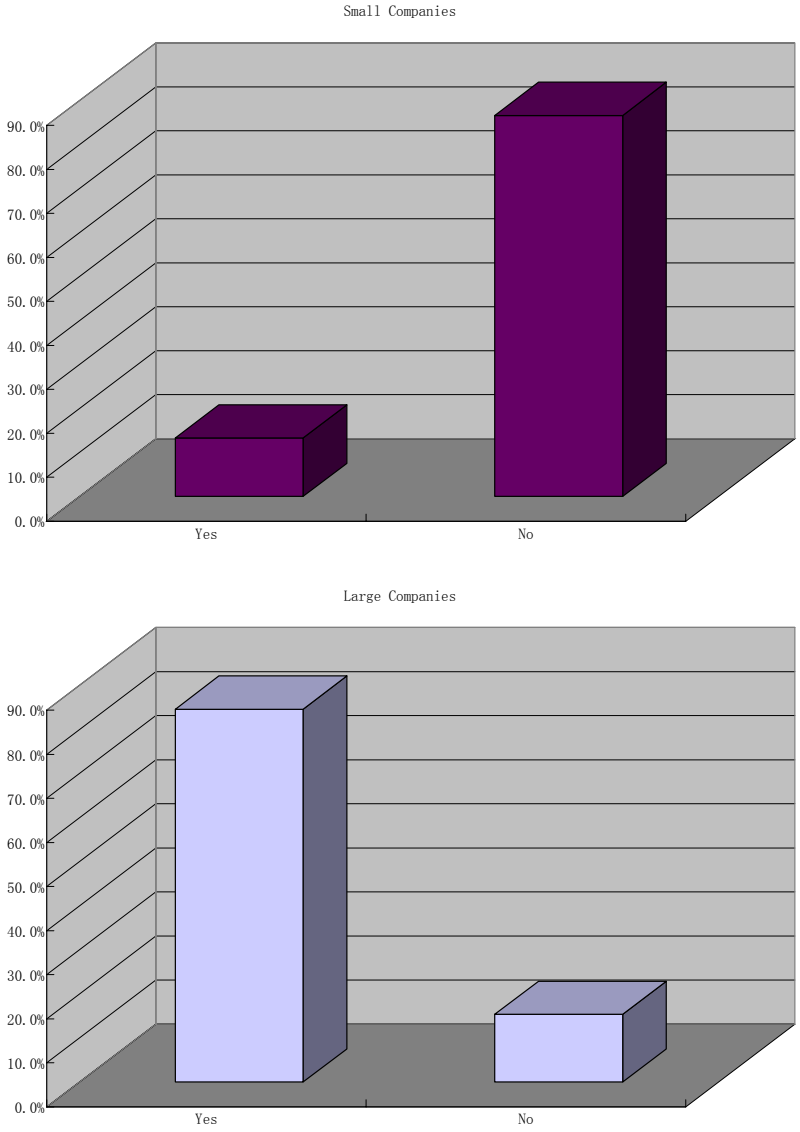


Table 2.21A Business Has Equipment Frequently Used In Recycling: Loading Dock

	Yes	No
All Small Businesses	13.3%	86.7%
Manufacturing	66.7%	33.3%
Retail	10.0%	90.0%
Services	5.6%	94.4%
All Other	14.3%	85.7%
All Large Businesses	84.6%	15.4%
Manufacturing	100.0%	0.0%
Nonmanufacturing	60.0%	40.0%

Figure 2.15B Business Has Equipment Frequently Used In Recycling: A Fork Lift

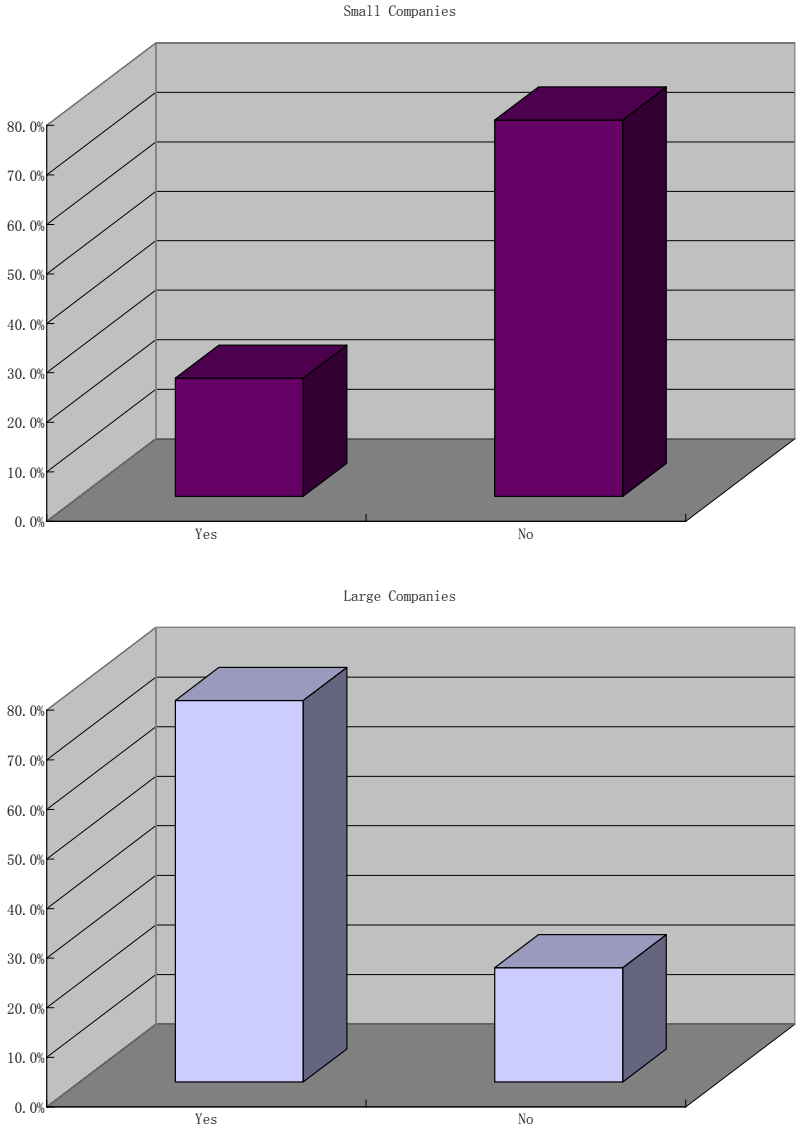


Table 2.21B Business Has Equipment Frequently Used In Recycling: Fork Lift

	Yes	No
All Small Businesses	23.9%	76.1%
Manufacturing	100.0%	0.0%
Retail	20.0%	80.0%
Services	21.1%	78.9%
All Other	14.3%	85.7%
All Large Businesses	76.9%	23.1%
Manufacturing	100.0%	0.0%
Nonmanufacturing	40.0%	60.0%

Figure 2.15C Business Has Equipment Frequently Used In Recycling: Baler

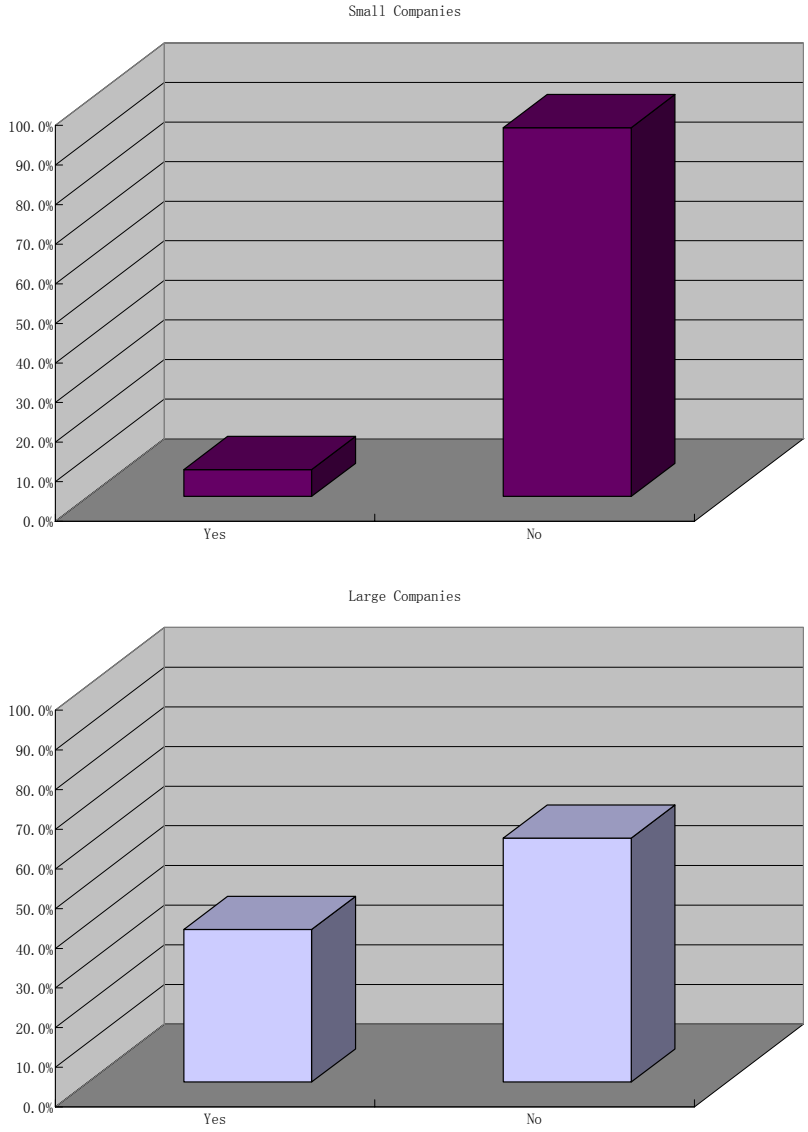


Table 2.21C Business Has Equipment Frequently Used In Recycling: Baler

	Yes	No
All Small Businesses	6.8%	93.2%
Manufacturing	0.0%	100.0%
Retail	0.0%	100.0%
Services	5.6%	94.4%
All Other	14.3%	85.7%
All Large Businesses	38.5%	61.5%
Manufacturing	62.5%	37.5%
Nonmanufacturing	0.0%	100.0%

Question 23: What variables do you use to measure progress in recycling and waste reduction?

Most small companies chose it varies, while most of large companies (especially large manufacturing companies) use pounds of material recycled to measure.

Figure 2.16 Variables Used To Measure Recycling And Waste Reduction Progress

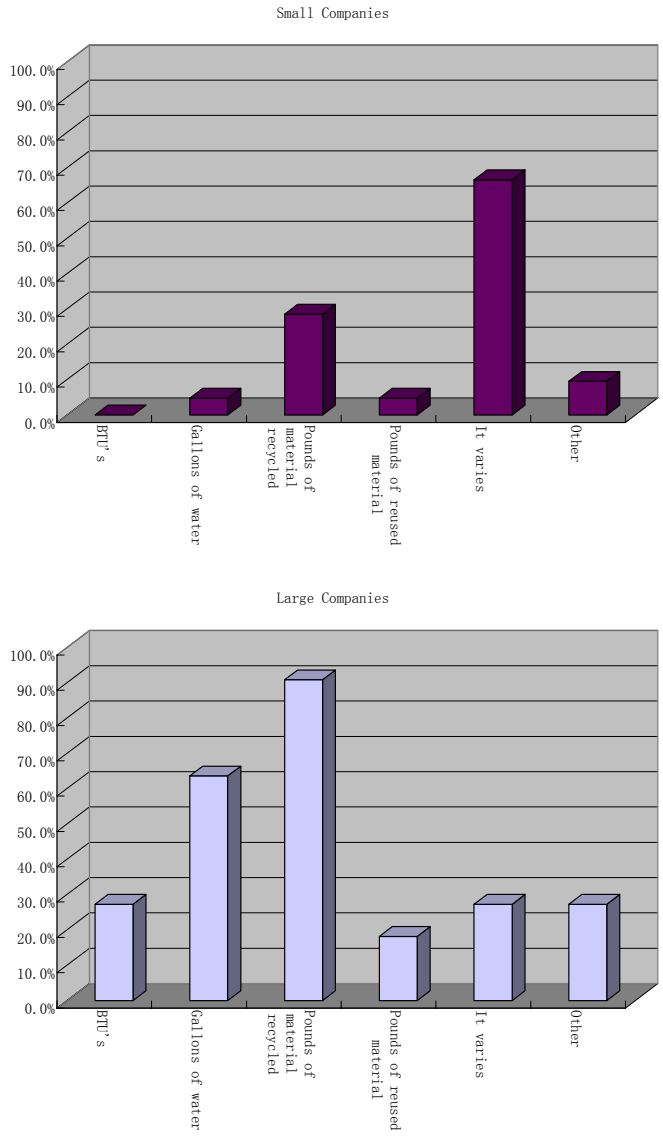


Table 2.22 Variables Used To Measure Recycling And Waste Reduction Progress

	BTU's	Gallons Of Water	Pounds Of Material Recycled	Pounds Of Reused Material	It Varies	Other
All Small Businesses	0.0%	4.8%	28.6%	4.8%	66.7%	9.5%
Manufacturing	0.0%	0.0%	33.3%	33.3%	66.7%	0.0%
Retail	0.0%	0.0%	33.3%	0.0%	66.7%	0.0%
Services	0.0%	0.0%	14.3%	0.0%	57.1%	14.3%
All Other	0.0%	12.5%	37.5%	0.0%	75.0%	0.0%
All Large Businesses	27.3%	63.6%	90.9%	18.2%	27.3%	27.3%
Manufacturing	37.5%	87.5%	100.0%	12.5%	12.5%	25.0%
Nonmanufacturing	0.0%	0.0%	66.7%	33.3%	66.7%	33.3%

Question 24: What do you do with construction and demolition waste?

More of the companies chose to throw it away regardless of company size or company group. Sub-division shows similar results.

Figure 2.17 Current Treatment Of Construction And Demolition Waste

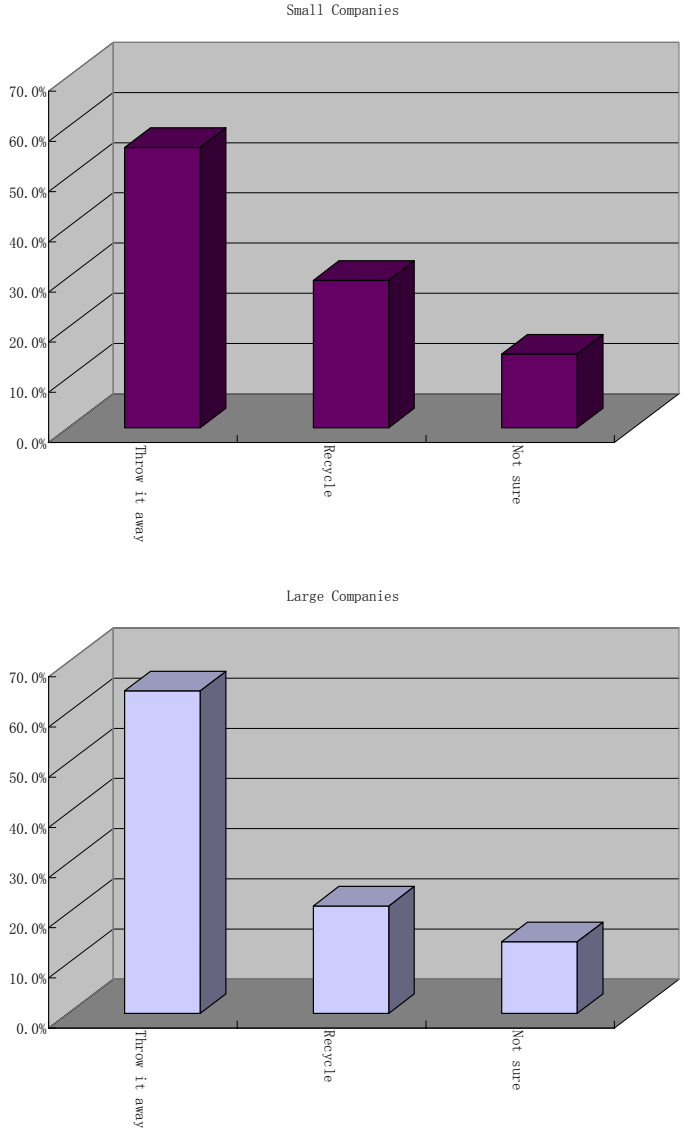


Table 2.23 Current Treatment Of Construction And Demolition Waste

	Throw It Away	Recycle	Not Sure
All Small Businesses	55.9%	29.4%	14.7%
Manufacturing	66.7%	33.3%	0.0%
Retail	57.1%	28.6%	14.3%
Services	57.1%	21.4%	21.4%
All Other	50.0%	40.0%	10.0%
All Large Businesses	64.3%	21.4%	14.3%
Manufacturing	55.6%	22.2%	22.2%
Nonmanufacturing	80.0%	20.0%	0.0%

Question 25: What do you perceive as the main barriers to recycling and reducing waste?

Most of the small companies chose cost or time, while more of the large companies chose cost or lack of markets. Most small manufacturing companies chose lack of information or limited capital.

Figure 2.18 Perceived Barriers To Recycling And Waste Reduction

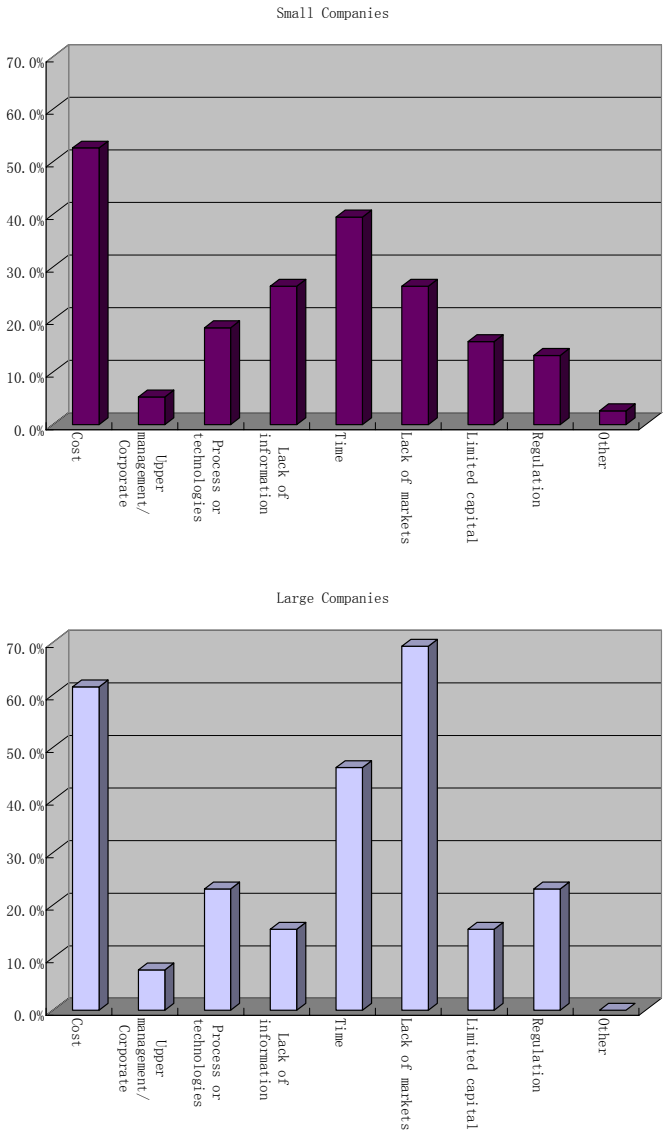


Table 2.24 Perceived Barriers To Recycling And Waste Reduction

	Cost	Upper Management/ Corporate	Process Or Technologies	Lack Of Information	Time	Lack Of Markets	Limited Capital	Regulation	Other
All Small Businesses	52.6%	5.3%	18.4%	26.3%	39.5%	26.3%	15.8%	13.2%	2.6%
Manufacturing	33.3%	33.3%	0.0%	66.7%	0.0%	33.3%	66.7%	0.0%	0.0%
Retail	42.9%	0.0%	14.3%	14.3%	42.9%	42.9%	28.6%	14.3%	0.0%
Services	52.9%	0.0%	17.6%	29.4%	41.2%	11.8%	0.0%	17.6%	5.9%
All Other	63.6%	9.1%	27.3%	18.2%	45.5%	36.4%	18.2%	9.1%	0.0%
All Large Businesses	61.5%	7.7%	23.1%	15.4%	46.2%	69.2%	15.4%	23.1%	0.0%
Manufacturing	50.0%	0.0%	25.0%	25.0%	37.5%	75.0%	12.5%	12.5%	0.0%
Nonmanufacturing	80.0%	20.0%	20.0%	0.0%	60.0%	60.0%	20.0%	40.0%	0.0%

Chapter 3 Grand Island

Business Demographics

Question 1: Please mark the category that best describes your business

We can see from the following two charts that for small companies, more of the respondent companies are from the service and retail categories (with services accounting for 25% and retail 22%); for large respondent companies, most of the respondent companies are in retail and manufacturing (with retail accounting for 21% and manufacturing 32%).

Figure 3.1 Business Type

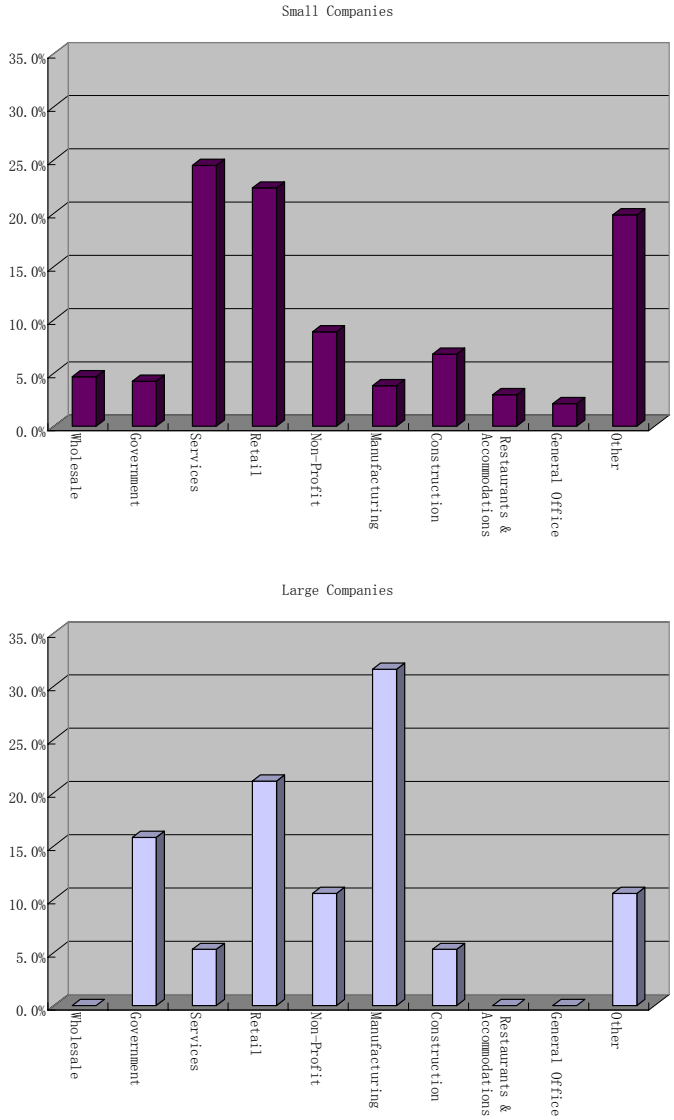


Table 3.1 Business Type

	Small	Large
Wholesale	4.6%	0.0%
Government	4.2%	15.8%
Services	24.5%	5.3%
Retail	22.4%	21.1%
Non-Profit	8.9%	10.5%
Manufacturing	3.8%	31.6%
Construction	6.8%	5.3%
Restaurants & Accommodations	3.0%	0.0%
General Office	2.1%	0.0%
Other	19.8%	10.5%

Question 2: How many people are employed by your business at your location?

For small companies, 87% of the respondent companies have fewer than 20 employees. For large companies, half of the companies belong to the group with 100-249 employees.

Figure 3.2 Employment Count

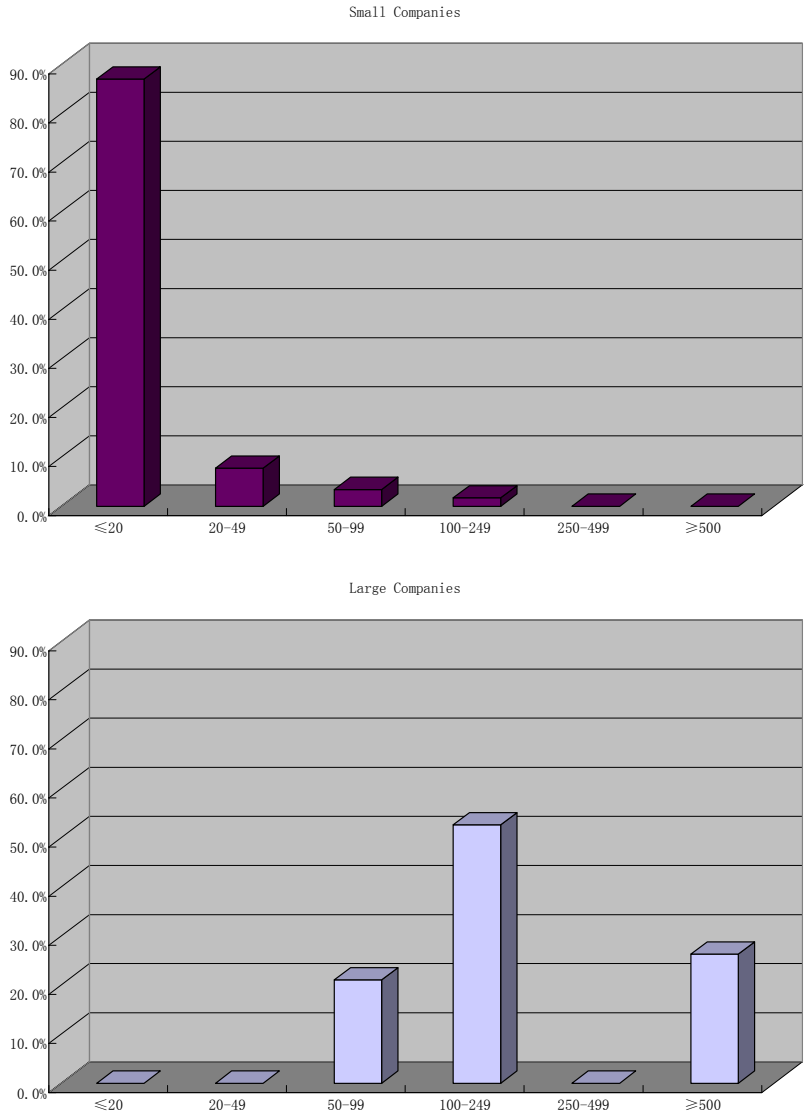


Table 3.2 Employment Count

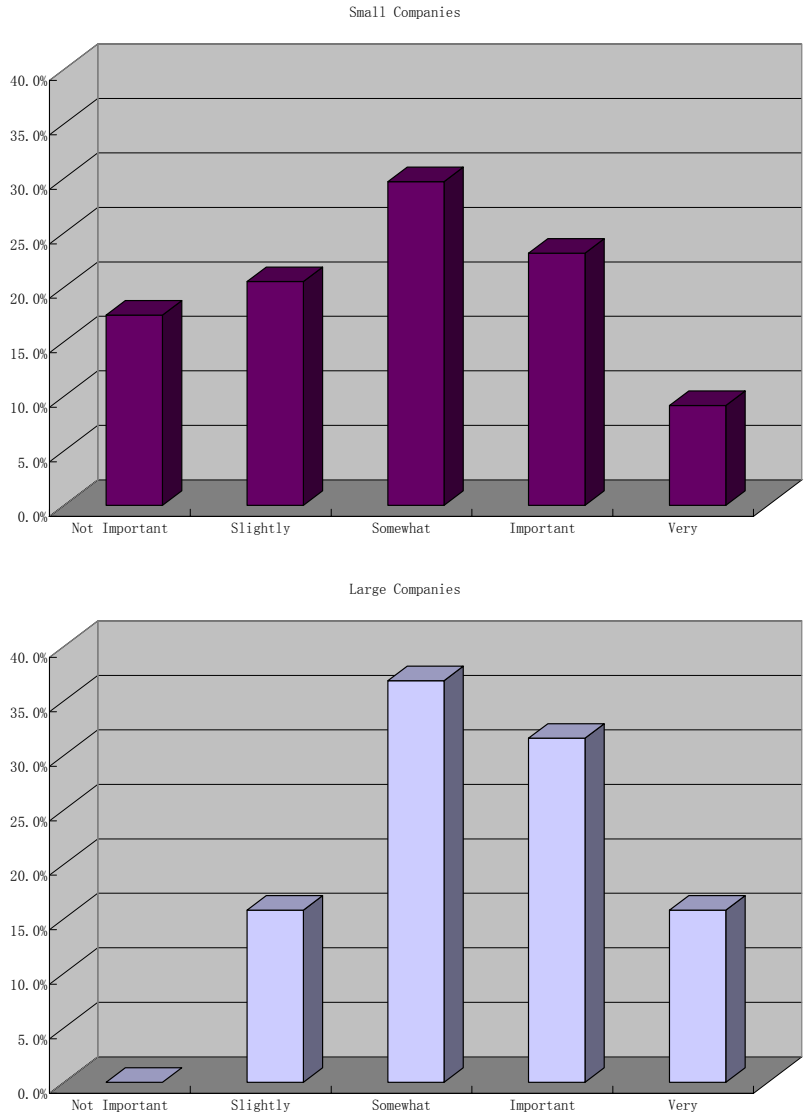
	Small	Large
≤20	87.1%	0.0%
20-49	7.8%	0.0%
50-99	3.4%	21.1%
100-249	1.7%	52.6%
250-499	0.0%	0.0%
≥500	0.0%	26.3%

Business Attitudes About Recycling

Question 3: How important is recycling and waste reduction to your business?

For small companies, few of the respondent companies think of recycling as very important, with a share of about one-fifth saying important and 9% choosing very important. For large companies, about one-third regard it as important and 16% chose very important.

Figure 3.3 Importance Of Recycling To The Business



We further divide all small businesses into four groups: manufacturing, retail, services, and all other. We also divide all large businesses into two groups: manufacturing and nonmanufacturing. The following table provides such information. Manufacturing companies tend to put more importance on recycling and waste reduction, especially large manufacturing companies.

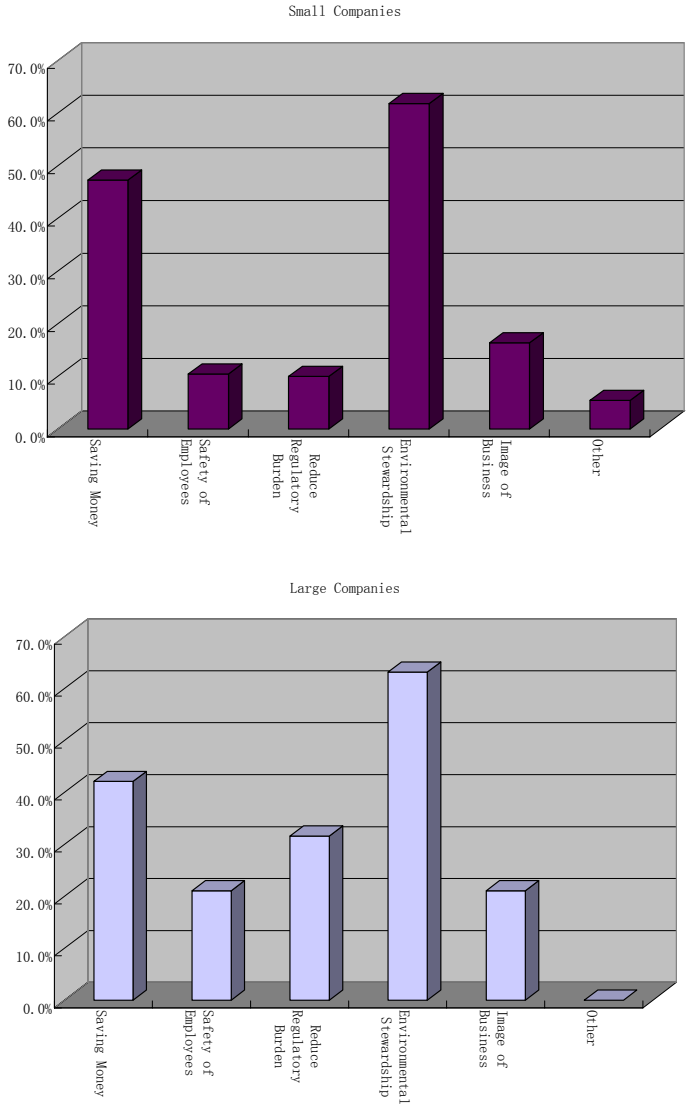
Table 3.3 Importance Of Recycling To The Business, By Business Type

	Not Important	Slightly	Somewhat	Important	Very
All Small Businesses	17.5%	20.5%	29.7%	23.1%	9.2%
Manufacturing	11.1%	11.1%	22.2%	44.4%	11.1%
Retail	20.0%	20.0%	32.0%	16.0%	12.0%
Services	23.2%	16.1%	28.6%	23.2%	8.9%
All Other	13.9%	23.5%	30.4%	24.3%	7.8%
All Large Businesses	0.0%	15.8%	36.8%	31.6%	15.8%
Manufacturing	0.0%	0.0%	16.7%	50.0%	33.3%
Nonmanufacturing	0.0%	23.1%	46.2%	23.1%	7.7%

Question 4: What would be your top priority or priorities for participating in waste reduction and/or recycling?

For both small and large companies, most of the respondent companies chose saving money and environmental stewardship, with environmental stewardship accounting for a larger share.

Figure 3.4A Top Priorities In Participating In Waste Reduction



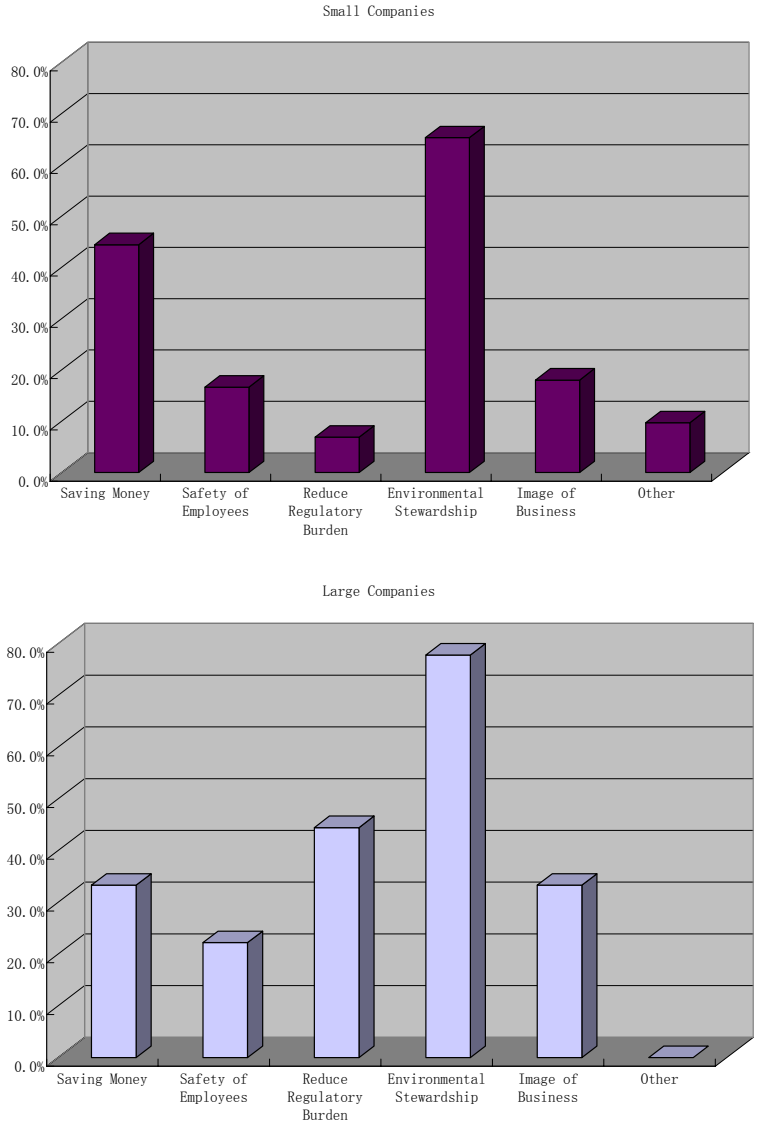
For this question, we again further divide all small businesses into four groups: manufacturing, retail, services, and all other. We divide all large businesses into two groups: manufacturing and nonmanufacturing. The following table provides the results. The results did not change much with the sub-division of groups.

Table 3.4 Top Priorities In Participating In Waste Reduction

	Saving Money	Safety of Employees	Reduce Regulatory Burden	Environmental Stewardship	Image of Business	Other
All Small Businesses	47.3%	10.5%	10.0%	61.8%	16.4%	5.5%
Manufacturing	42.9%	0.0%	14.3%	57.1%	14.3%	0.0%
Retail	54.9%	7.8%	7.8%	51.0%	13.7%	0.0%
Services	41.8%	9.1%	9.1%	60.0%	10.9%	0.0%
All Other	47.2%	13.0%	11.1%	68.5%	20.4%	0.9%
All Large Businesses	42.1%	21.1%	31.6%	63.2%	21.1%	0.0%
Manufacturing	50.0%	16.7%	50.0%	66.7%	33.3%	0.0%
Nonmanufacturing	38.5%	23.1%	23.1%	61.5%	15.4%	0.0%

The following two charts represent responses for this question from companies that chose important or very important in question 3. The results did not change significantly for small companies. But the structure changed a bit for large companies, with the share choosing environmental stewardship increasing by about 10%.

Figure 3.4B Top Priorities In Participating In Waste Reduction For Firms Responding Important Or Very Important



Recycling Activity and Interest

Question 5: Does your business currently have a waste reduction program?
Question 6: Does your business currently have a recycling program?

We again further divide all small businesses into four groups: manufacturing, retail, services, and all other. We divide all large businesses into two groups: manufacturing and nonmanufacturing. The table below shows that 44% of the small respondent companies have neither of the programs, while only 10% of the large respondent companies have neither of the programs. Among the large firms, more than half of the companies had both programs, while 5% had waste reduction programs only. Among small firms, 24% had both programs, while 4% had waste reduction only. It was rare for firms to have a waste reduction program without a recycling program. Among small businesses, sub-divided groups still followed the same structure, except more of the companies have both of the programs rather than having neither of the programs. Among large businesses, we can see that in the manufacturing sector, all companies have at least one program, and two-thirds of the companies have both programs. In the nonmanufacturing sector, 46% of the companies have both programs, and 15% have neither.

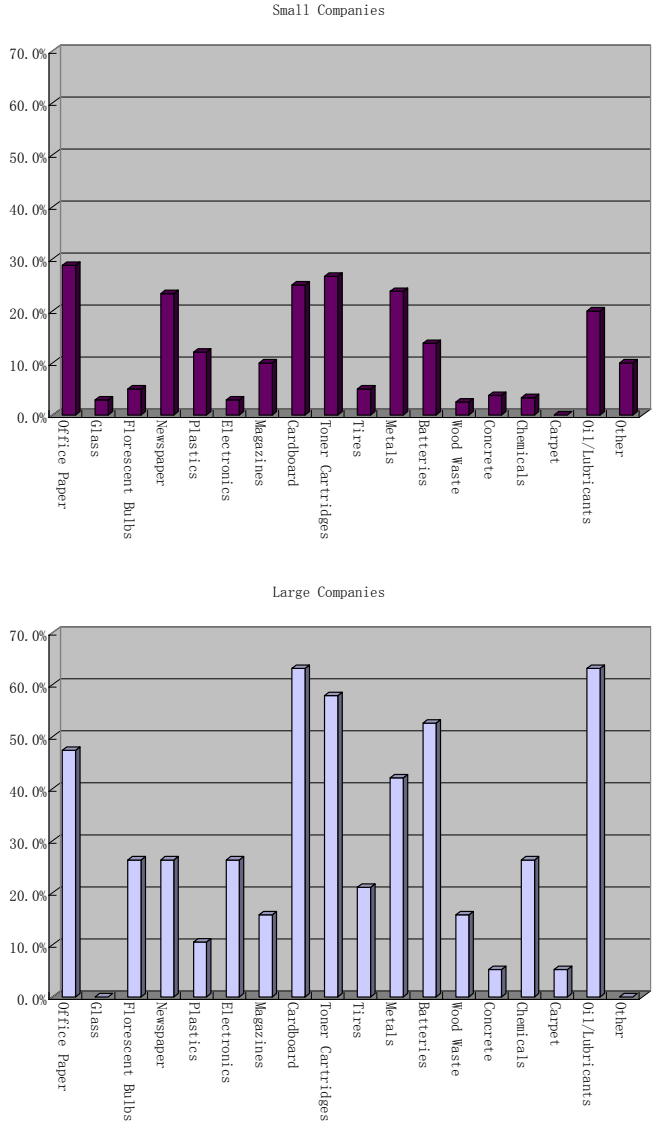
Table 3.5 Companies With Current Waste Reduction Or Recycling Programs

	None	Waste Reduction	Recycling	Both
All Small Businesses	43.9%	3.8%	28.3%	24.1%
Manufacturing	33.3%	0.0%	22.2%	44.4%
Retail	41.5%	7.5%	24.5%	26.4%
Services	54.4%	1.8%	24.6%	19.3%
All Other	43.0%	3.3%	31.4%	22.3%
All Large Businesses	10.5%	5.3%	31.6%	52.6%
Manufacturing	0.0%	0.0%	33.3%	66.7%
Nonmanufacturing	15.4%	7.7%	30.8%	46.2%

Question 7: Which of the following does your company currently recycle?

For small companies, about 25% of respondent companies currently recycle office paper, newspaper, cardboard, toner cartridges and metals. For large companies, half of respondent companies have recycled office paper, cardboard, toner cartridges, batteries, and oil/lubricants. Only 5% of small respondent companies and 26% of large ones currently recycle fluorescent bulbs; and 2.9% of small respondent companies and 263% of large ones currently recycle electronics. Large companies have done better in recycling—the bars in the charts show a higher share of large companies than small companies.

Figure 3.5 What Companies Currently Recycle



For this question, we also further divide all small businesses into four groups: manufacturing, retail, services, and all other. We divide all large businesses into two groups: manufacturing and nonmanufacturing. Small manufacturers are more likely to recycle metals, oil/lubricants, and cardboards. Large manufacturers recycle more of most materials.

Table 3.6 What Companies Currently Recycle By Industry Category

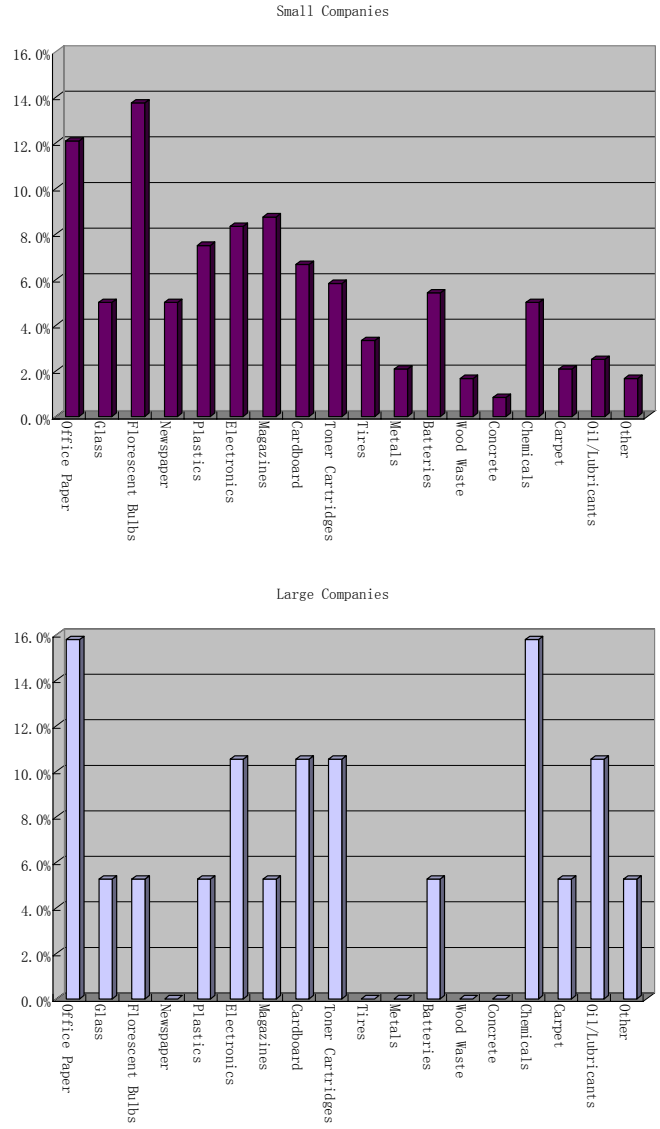
	All Small Businesses	Manufacturing	Retail	Services	All Other
Office Paper	28.8%	22.2%	24.5%	31.0%	29.8%
Glass	2.9%	0.0%	1.9%	3.4%	3.3%
Fluorescent Bulbs	5.0%	0.0%	5.7%	1.7%	6.6%
Newspaper	23.3%	22.2%	20.8%	29.3%	21.5%
Plastics	12.1%	11.1%	9.4%	12.1%	13.2%
Electronics	2.9%	11.1%	0.0%	0.0%	5.0%
Magazines	10.0%	0.0%	11.3%	13.8%	8.3%
Cardboard	25.0%	33.3%	45.3%	10.3%	22.3%
Toner Cartridges	26.7%	11.1%	22.6%	27.6%	28.9%
Tires	5.0%	0.0%	7.5%	3.4%	5.0%
Metals	23.8%	66.7%	22.6%	15.5%	24.8%
Batteries	13.8%	11.1%	17.0%	13.8%	12.4%
Wood Waste	2.5%	11.1%	1.9%	0.0%	3.3%
Concrete	3.8%	11.1%	1.9%	0.0%	5.8%
Chemicals	3.3%	0.0%	1.9%	3.4%	4.1%
Carpet	0.0%	0.0%	0.0%	0.0%	0.0%
Oil/Lubricants	20.0%	33.3%	17.0%	19.0%	20.7%
Other	10.0%	0.0%	0.0%	0.0%	2.5%

	All Large Businesses	Manufacturing	Nonmanufacturing
Office Paper	47.4%	16.7%	61.5%
Glass	0.0%	0.0%	0.0%
Fluorescent Bulbs	26.3%	66.7%	7.7%
Newspaper	26.3%	0.0%	38.5%
Plastics	10.5%	16.7%	7.7%
Electronics	26.3%	33.3%	23.1%
Magazines	15.8%	0.0%	23.1%
Cardboard	63.2%	83.3%	53.8%
Toner Cartridges	57.9%	66.7%	53.8%
Tires	21.1%	0.0%	30.8%
Metals	42.1%	100.0%	15.4%
Batteries	52.6%	66.7%	46.2%
Wood Waste	15.8%	33.3%	7.7%
Concrete	5.3%	0.0%	7.7%
Chemicals	26.3%	50.0%	15.4%
Carpet	5.3%	16.7%	0.0%
Oil/Lubricants	63.2%	100.0%	46.2%
Other	0.0%	0.0%	0.0%

Question 8: For which materials would you like more information about recycling?

For small companies, more than 12% of respondent companies need information about recycling office paper and fluorescent bulbs; about 8% of the companies need information about electronics and magazines. For large companies, about 16% of respondent companies need information about recycling office paper and chemicals; about 10% of the companies need information about cardboard, electronics, toner cartridges, and oil/lubricants; 5% of companies need information about fluorescent bulbs.

Figure 3.6 What Recycling Information Companies Need



For this question, we also further divide all small businesses into four groups: manufacturing, retail, services, and all other. We divide all large businesses into two groups: manufacturing and nonmanufacturing. From this table, we can see the companies' need for information in recycling different materials differs across sectors.

Table 3.7 What Recycling Information Companies Need, By Business Category

	All Small Businesses	Manufacturing	Retail	Services	All Other
Office Paper	12.1%	11.1%	7.5%	15.5%	13.2%
Glass	5.0%	0.0%	3.8%	5.2%	5.8%
Fluorescent Bulbs	13.8%	11.1%	13.2%	20.7%	11.6%
Newspaper	5.0%	0.0%	5.7%	6.9%	4.1%
Plastics	7.5%	0.0%	5.7%	6.9%	9.1%
Electronics	8.3%	11.1%	5.7%	5.2%	10.7%
Magazines	8.8%	0.0%	3.8%	19.0%	6.6%
Cardboard	6.7%	22.2%	5.7%	8.6%	5.8%
Toner Cartridges	5.8%	11.1%	5.7%	8.6%	5.0%
Tires	3.3%	0.0%	3.8%	3.4%	3.3%
Metals	2.1%	11.1%	1.9%	0.0%	2.5%
Batteries	5.4%	0.0%	7.5%	5.2%	5.0%
Wood Waste	1.7%	0.0%	1.9%	0.0%	2.5%
Concrete	0.8%	11.1%	0.0%	1.7%	0.0%
Chemicals	5.0%	0.0%	3.8%	1.7%	7.4%
Carpet	2.1%	0.0%	3.8%	1.7%	1.7%
Oil/Lubricants	2.5%	0.0%	3.8%	0.0%	3.3%
Other	1.7%	0.0%	0.0%	0.0%	0.0%

	All Large Businesses	Manufacturing	Nonmanufacturing
Office Paper	15.8%	33.3%	7.7%
Glass	5.3%	0.0%	7.7%
Fluorescent Bulbs	5.3%	0.0%	7.7%
Newspaper	0.0%	0.0%	0.0%
Plastics	5.3%	0.0%	7.7%
Electronics	10.5%	0.0%	15.4%
Magazines	5.3%	16.7%	0.0%
Cardboard	10.5%	16.7%	7.7%
Toner Cartridges	10.5%	0.0%	15.4%
Tires	0.0%	0.0%	0.0%
Metals	0.0%	0.0%	0.0%
Batteries	5.3%	16.7%	0.0%
Wood Waste	0.0%	0.0%	0.0%
Concrete	0.0%	0.0%	0.0%
Chemicals	15.8%	16.7%	15.4%
Carpet	5.3%	0.0%	7.7%
Oil/Lubricants	10.5%	16.7%	7.7%
Other	6.3%	0.0%	0.0%

Question 9: Please estimate how many of following are in use at your company and how many you anticipate disposing in the next 12 months.

We pooled 259 companies and applied the trends of that group to the roughly 3,000 businesses we identified in Grand Island to predict the totals for the community. The predicted numbers for equipment show some 24,000 computers and 25,000 monitors are being used, while 3,400 computers and 2,900 monitors will be disposed in the next 12 months.

Table 3.8 Equipment In Use And Estimated Disposal Needs

	Number Currently in Use	Number You Anticipate Disposing Within Next 12 Months
All		
Computers	24,100	3,400
Monitors/TVs	25,400	2,900
Printer/Fax	9,000	600
Copier	2,900	200
Telephones	28,300	1,400
Cell Phones	7,700	700
Handheld Electronics	4,200	500
Manufacturing		
Computers	2,000	300
Monitors/TVs	1,600	100
Printer/Fax	400	0
Copier	200	0
Telephones	1,900	100
Cell Phones	300	0
Handheld Electronics	100	0
Nonmanufacturing		
Computers	22,100	3,100
Monitors/TVs	23,800	2,800
Printer/Fax	8,600	600
Copier	2,700	200
Telephones	26,400	1,300
Cell Phones	7,400	700
Handheld Electronics	4,100	500

Question 10: How do you currently dispose of those items?

Computers are usually disposed by recycling and donating or using some other ways or by recycling only. For all the items, other ways or recycling only are commonly used.

Table 3.9 Current Disposal/Recycling Methods

	Computers	Monitors/ TVs	Printer Fax	Copier	Phones	Cell Phones	Handheld Electronics
All							
Recycling	414	243	87	13	263	247	3
Donate	165	176	129	12	71	188	0
Employees	216	353	24	0	0	0	35
Others	825	1665	318	82	986	207	460
Recycling+Donate	1058	175	0	0	0	0	0
Recycling+Employees	28	0	0	0	0	0	0
Recycling+Others	0	0	0	0	0	0	0
Donate+Employees	320	108	14	0	0	0	0
Donate+Others	0	0	0	0	0	0	0
Employees+Others	0	0	0	0	0	0	0
Recycling+Donate+Employees	0	0	0	0	0	0	0
Recycling+Donate+Others	0	0	0	0	0	0	0
Recycling+Employees+Others	0	0	0	0	0	0	0
Donate+Employees+Others	47	0	0	0	0	0	0
Recycling+Donate+Employees+Others	0	0	0	0	0	0	0
Not Specified	293	188	118	59	85	106	12
Manufacturing							
Recycling	170	137	40	2	0	8	3
Donate	0	0	0	0	0	0	0
Employees	0	0	0	0	0	0	0
Others	0	0	0	0	88	22	0
Recycling+Donate	0	0	0	0	0	0	0
Recycling+Employees	28	0	0	0	0	0	0
Recycling+Others	0	0	0	0	0	0	0
Donate+Employees	71	0	0	0	0	0	0
Donate+Others	0	0	0	0	0	0	0
Employees+Others	0	0	0	0	0	0	0
Recycling+Donate+Employees	0	0	0	0	0	0	0
Recycling+Donate+Others	0	0	0	0	0	0	0
Recycling+Employees+Others	0	0	0	0	0	0	0
Donate+Employees+Others	0	0	0	0	0	0	0
Recycling+Donate+Employees+Others	0	0	0	0	0	0	0
Not Specified	14	0	0	0	14	0	0

Table 2.9 (continued) Current Disposal/Recycling Methods

	Computers	Monitors/ TVs	Printer Fax	Copier	Phones	Cell Phones	Handheld Electronics
Nonmanufacturing							
Recycling	244	106	47	12	263	240	0
Donate	165	176	129	12	71	188	0
Employees	216	353	24	0	0	0	35
Others	825	1665	318	82	898	185	460
Recycling+Donate	1058	175	0	0	0	0	0
Recycling+Employees	0	0	0	0	0	0	0
Recycling+Others	0	0	0	0	0	0	0
Donate+Employees	249	108	14	0	0	0	0
Donate+Others	0	0	0	0	0	0	0
Employees+Others	0	0	0	0	0	0	0
Recycling+Donate+Employees	0	0	0	0	0	0	0
Recycling+Donate+Others	0	0	0	0	0	0	0
Recycling+Employees+Others	0	0	0	0	0	0	0
Donate+Employees+Others	47	0	0	0	0	0	0
Recycling+Donate+Employees+Others	0	0	0	0	0	0	0
Not Specified	279	188	118	59	71	106	12

Question 11: Is your company willing to get involved in recycling if it will require (a) spending money for equipment; (b) spending money for recycling fees; (c) employee (or your own) man-hours.

For the part (a) of the question, most of the small companies answered no, and about 45% of the large companies answered no. A slightly larger share of large companies answered yes relative to the small company group.

For the part (b) of the question, more than half of the small companies answered no, while about one-third of large companies answered no. A larger share of large companies answered yes relative to small company group.

For part (c) of the question, almost equal shares of small companies answered yes, no, or not sure, while few of the large companies answered no. More than half answered not sure, and one-third answered yes.

Companies appear to be more willing to devote man-hours instead of spending money to get involved in recycling.

Figure 3.7A Company Is Willing To Get Involved In Recycling If It Will Require Spending Money For Equipment

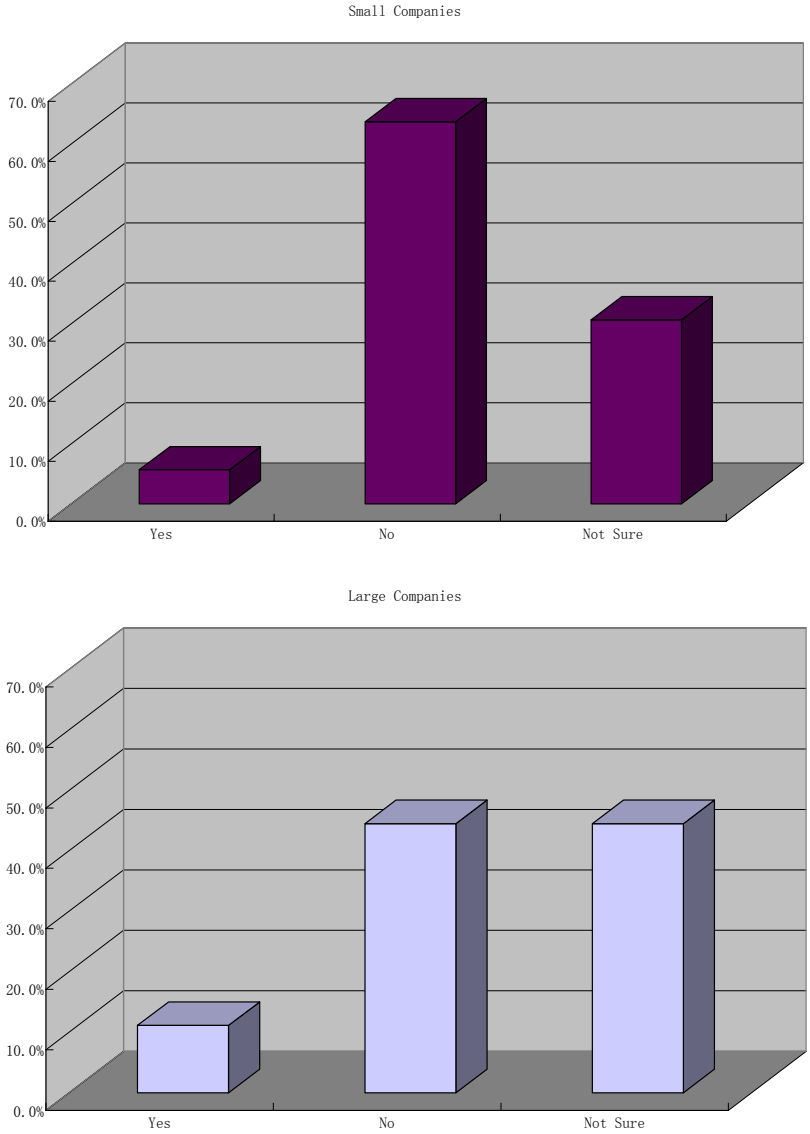


Table 3.7A Company Is Willing To Get Involved In Recycling If It Will Require Spending Money For Equipment

	Yes	No	Not Sure
All Small Businesses	5.7%	63.7%	30.7%
Manufacturing	12.5%	50.0%	37.5%
Retail	2.1%	68.1%	29.8%
Services	5.8%	76.9%	17.3%
All Other	6.6%	55.7%	37.7%
All Large Businesses	11.1%	44.4%	44.4%
Manufacturing	16.7%	33.3%	50.0%
Nonmanufacturing	8.3%	50.0%	41.7%

Figure 3.7B Company Is Willing To Get Involved In Recycling If It Will Require Spending Money For Recycling Fees

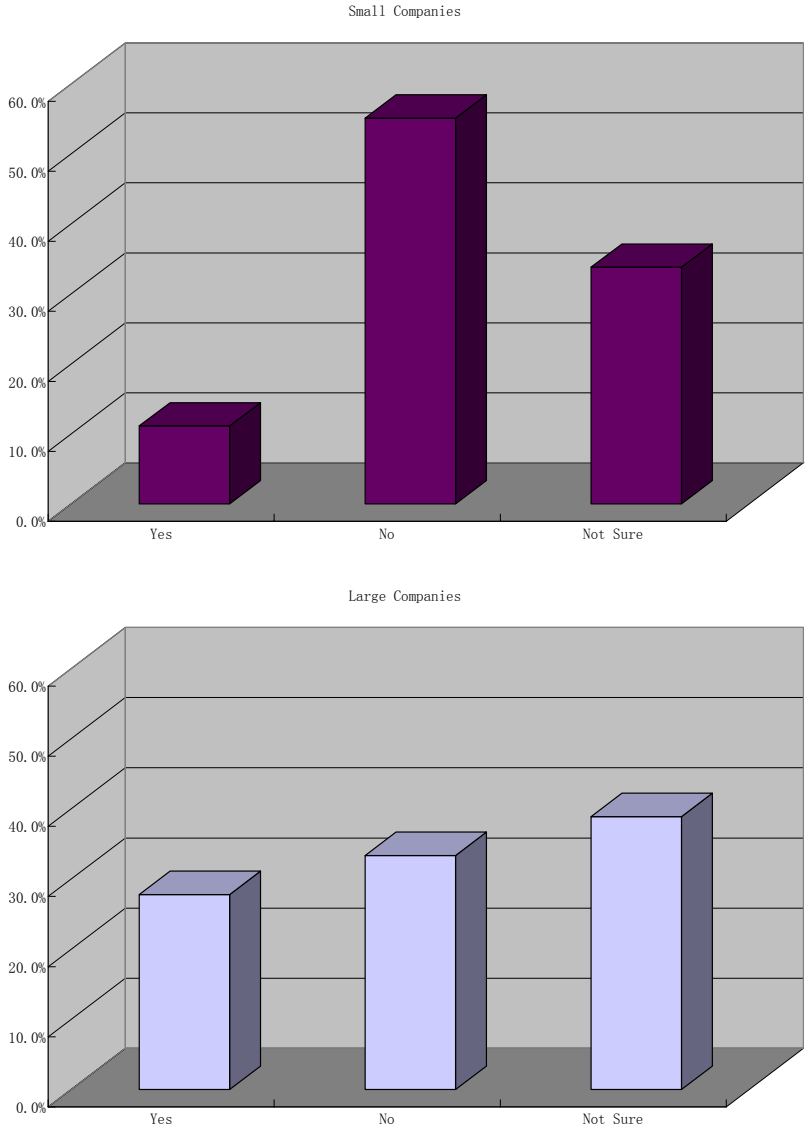


Table 3.10B Company Is Willing To Get Involved In Recycling If It Will Require Spending Money For Recycling Fees

	Yes	No	Not Sure
All Small Businesses	11.1%	55.1%	33.8%
Manufacturing	0.0%	55.6%	44.4%
Retail	4.3%	59.6%	36.2%
Services	9.4%	66.0%	24.5%
All Other	15.7%	47.2%	37.0%
All Large Businesses	27.8%	33.3%	38.9%
Manufacturing	33.3%	16.7%	50.0%
Nonmanufacturing	25.0%	41.7%	33.3%

Figure 3.7C Company Is Willing To Get Involved In Recycling If It Will Require Employee (Or Your Own) Man-Hours

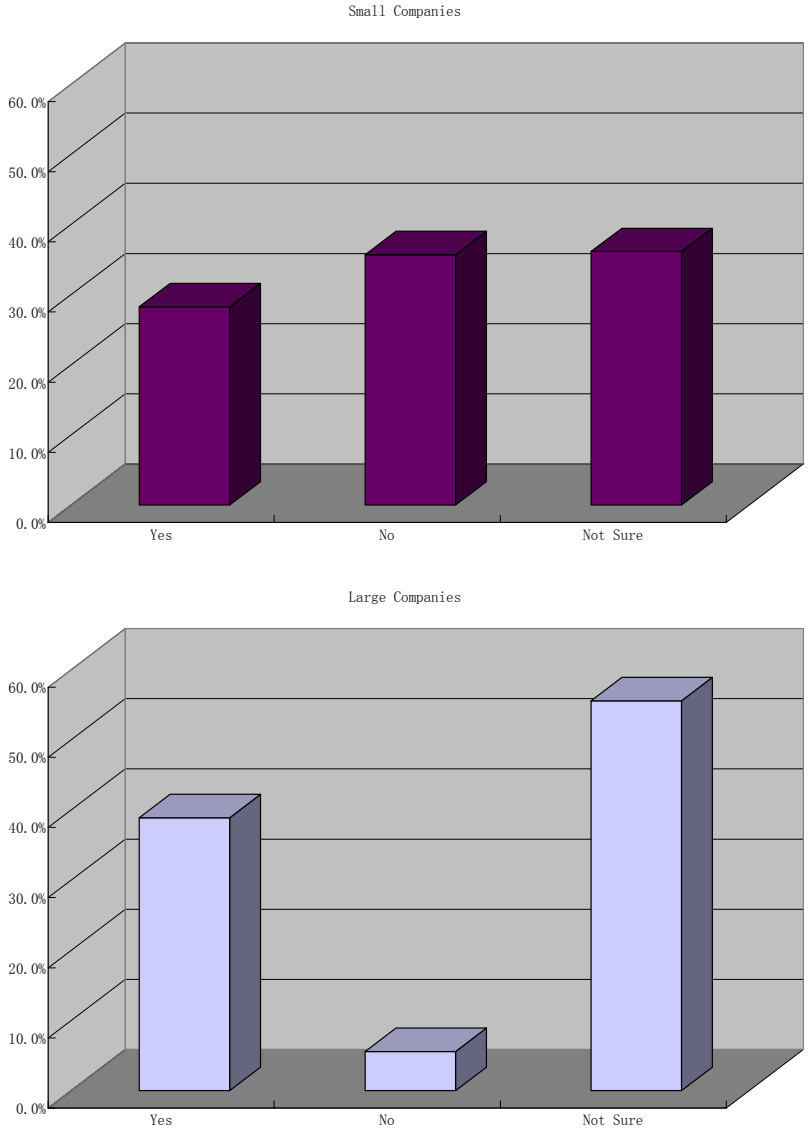


Table 3.10C Company Is Willing To Get Involved In Recycling If It Will Require Employee (Or Your Own) Man-Hours

	Yes	No	Not Sure
All Small Businesses	28.2%	35.6%	36.1%
Manufacturing	25.0%	37.5%	37.5%
Retail	12.5%	47.9%	39.6%
Services	35.8%	39.6%	24.5%
All Other	31.5%	27.8%	40.7%
All Large Businesses	38.9%	5.6%	55.6%
Manufacturing	33.3%	0.0%	66.7%
Nonmanufacturing	41.7%	8.3%	50.0%

Question 12: An on-site waste assessment is a one-time evaluation to determine opportunities for waste reduction and recycling. Would you be interested in a no cost, confidential waste assessment?

Most of the answers from small companies are negative. More than half of the answers from large companies are uncertain or likely. Manufacturing companies tend to answer more positively than do other companies.

Figure 3.8 Interest In A No-Cost Confidential Waste Assessment

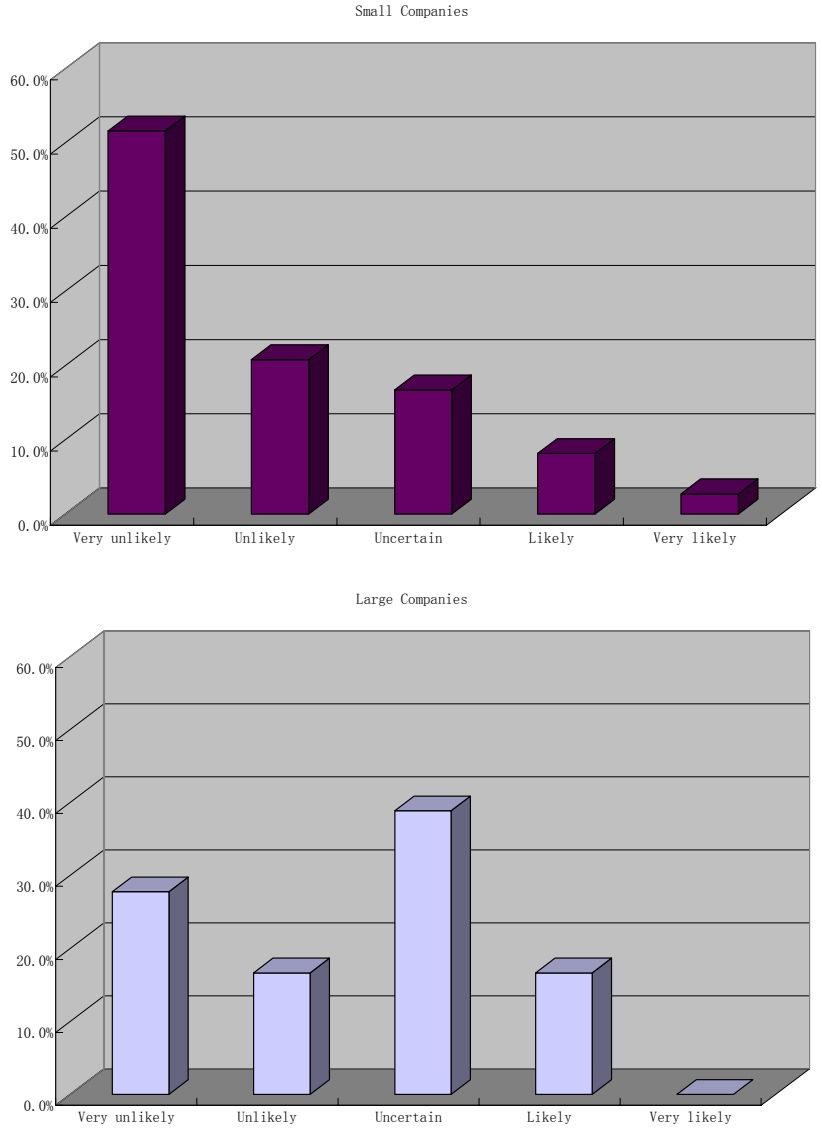


Table 3.11 Interest In A No-Cost Confidential Waste Assessment

	Very Unlikely	Unlikely	Uncertain	Likely	Very Likely
All Small Businesses	51.6%	20.8%	16.7%	8.1%	2.7%
Manufacturing	33.3%	22.2%	33.3%	11.1%	0.0%
Retail	58.8%	21.6%	17.6%	2.0%	0.0%
Services	60.4%	18.9%	9.4%	7.5%	3.8%
All Other	45.0%	21.1%	18.3%	11.9%	3.7%
All Large Businesses	27.8%	16.7%	38.9%	16.7%	0.0%
Manufacturing	33.3%	0.0%	33.3%	33.3%	0.0%
Nonmanufacturing	25.0%	25.0%	41.7%	8.3%	0.0%

Question 13: If you were to have an on-site waste assessment, for which of the following topics would you request assistance?

A majority of small companies chose disposing of electronic equipment or recycling specific material/class. A majority of large companies chose reducing scrap rate, conducting energy efficiency studies, or recycling specific material/class. More than half of small manufacturing companies chose disposing of electronic equipment. Three-fourths of large manufacturing companies chose reducing scrap rate, or setting up/improving waste program.

Figure 3.9 Topics Of Interest For On-Site Waste Assessment

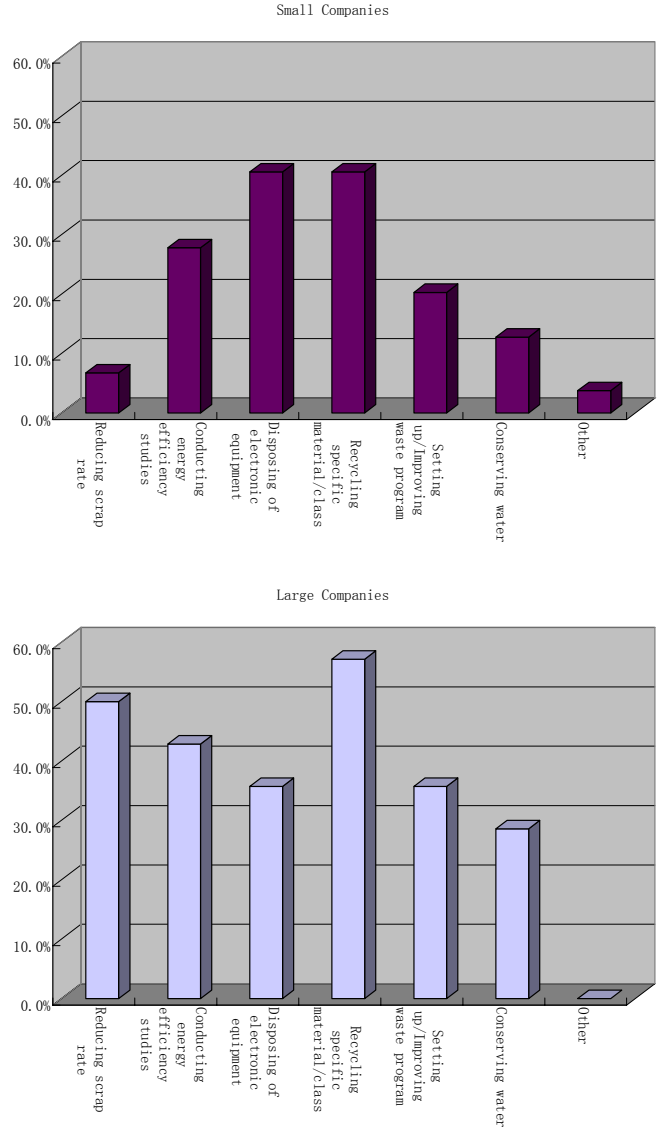


Table 3.12 Topics Of Interest For On-Site Waste Assessment

	Reducing Scrap Rate	Conducting Energy Efficiency Studies	Disposing Of Electronic Equipment	Recycling Specific Material/ Class	Setting Up/ Improving Waste Program	Conserving Water	Other
All Small Businesses	6.8%	27.8%	40.6%	40.6%	20.3%	12.8%	3.8%
Manufacturing	14.3%	0.0%	57.1%	42.9%	14.3%	14.3%	0.0%
Retail	17.4%	21.7%	39.1%	60.9%	13.0%	8.7%	0.0%
Services	3.1%	28.1%	43.8%	34.4%	28.1%	21.9%	0.0%
All Other	4.2%	31.9%	38.9%	37.5%	19.4%	9.7%	0.0%
All Large Businesses	50.0%	42.9%	35.7%	57.1%	35.7%	28.6%	0.0%
Manufacturing	75.0%	50.0%	0.0%	25.0%	75.0%	50.0%	0.0%
Nonmanufacturing	40.0%	40.0%	50.0%	70.0%	20.0%	20.0%	0.0%

Question 14: It can cost $10-$15 per monitor and close to $0.60 per fluorescent bulbs to recycle. Are you willing to pay this amount to dispose of monitors and fluorescent bulbs properly?

Large companies tended to answer more positively than did small companies. For large manufacturers, two-fifths chose likely and two-fifths chose very likely.

Figure 3.10 Willingness To Pay For Disposal Of Monitors And Bulbs

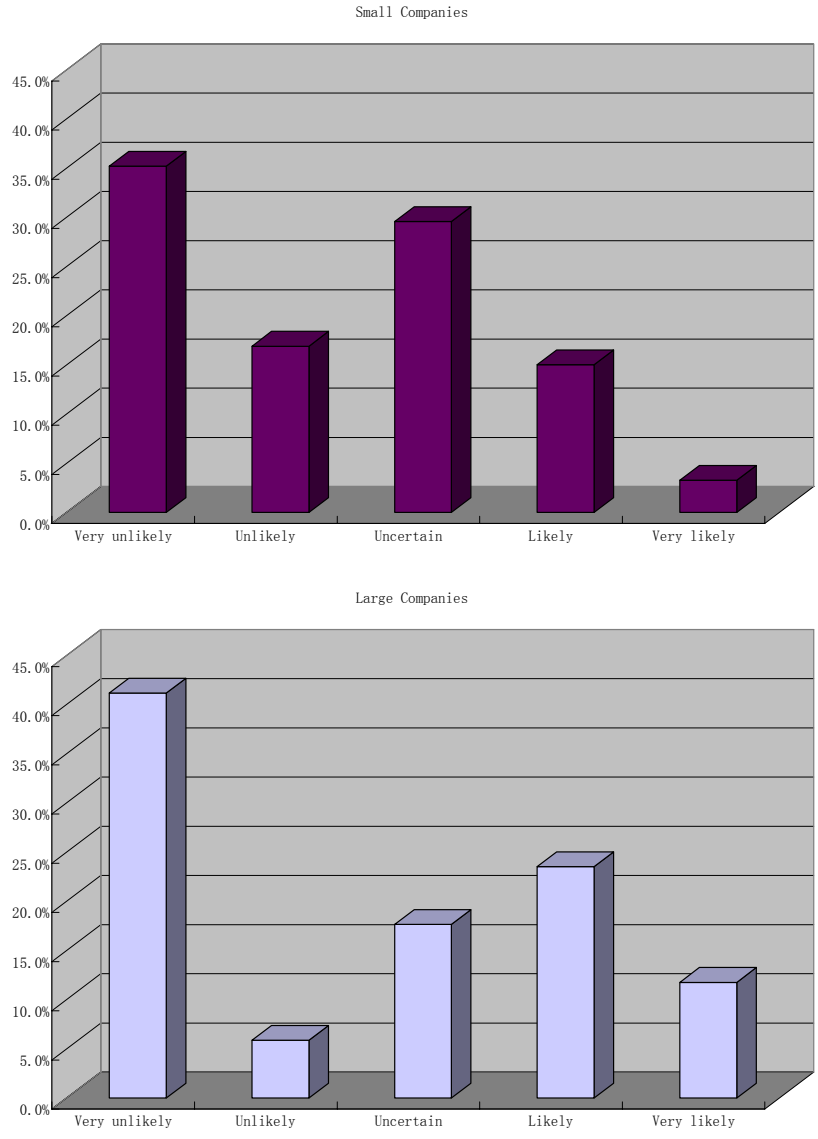


Table 3.13 Willingness To Pay For Disposal Of Monitors And Bulbs

	Very Unlikely	Unlikely	Uncertain	Likely	Very Likely
All Small Businesses	35.2%	16.9%	29.6%	15.0%	3.3%
Manufacturing	33.3%	11.1%	22.2%	22.2%	11.1%
Retail	44.9%	10.2%	34.7%	8.2%	2.0%
Services	37.3%	13.7%	29.4%	17.6%	2.0%
All Other	29.5%	21.9%	28.6%	16.2%	3.8%
All Large Businesses	41.2%	5.9%	17.6%	23.5%	11.8%
Manufacturing	20.0%	0.0%	0.0%	40.0%	40.0%
Nonmanufacturing	50.0%	8.3%	25.0%	16.7%	0.0%

Question 15: Resource management is an ongoing consulting service that helps businesses save money by reducing waste and lowering garbage hauling fee. Would you be interested in paying for this service if it cost $XXX for one year of service?

Table 3.14 Likelihood Of Being Willing To Pay For A Certain Amount Of Money As A Function Of Cost

	# of Surveys	# Say Yes	% Say Yes
$500	33	1	3.0%
$1000	54	1	1.9%
$2000	57	1	1.8%
$3000	58	0	0.0%
$5000	27	2	7.4%

Question 16: Which technical skills would you want in an assessor?

For small companies, more than half of the companies want an assessor with environmental skills and 46% want an assessor with economic skills. For large companies, more than two-thirds of the companies want an assessor with environmental skills, and at least half of the companies need an assessor with skills in regulatory and hazardous materials. All large manufacturing companies want an assessor with skills in environmental areas, while all small manufacturing companies want an assessor with skills in the regulatory arena.

Figure 3.11 Technical Assessor Skills Wanted

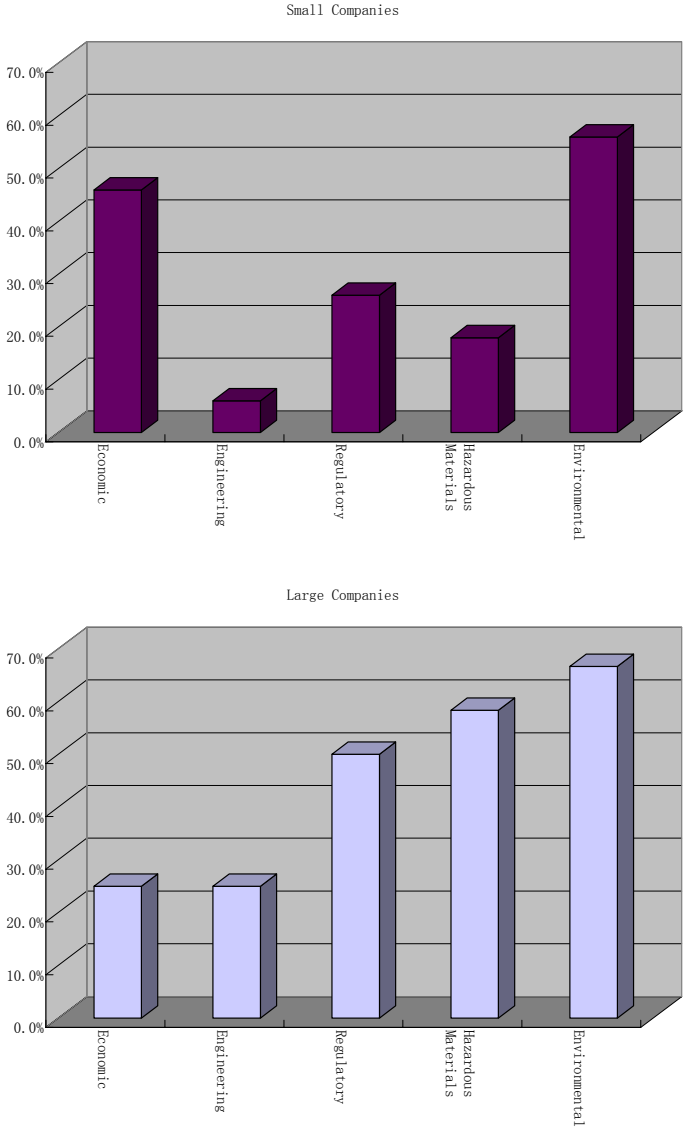


Table 3.15 Technical Assessor Skills Wanted

	Economic	Engineering	Regulatory	Hazardous Materials	Environmental
All Small Businesses	46.0%	6.0%	26.0%	18.0%	56.0%
Manufacturing	50.0%	50.0%	100.0%	50.0%	50.0%
Retail	44.4%	11.1%	11.1%	11.1%	88.9%
Services	53.8%	0.0%	15.4%	15.4%	53.8%
All Other	42.3%	3.8%	30.8%	19.2%	46.2%
All Large Businesses	25.0%	25.0%	50.0%	58.3%	66.7%
Manufacturing	33.3%	33.3%	66.7%	66.7%	100.0%
Nonmanufacturing	22.2%	22.2%	44.4%	55.6%	55.6%

Question 17: If your company had a storage facility or drop-off site for recyclable materials (beyond what is generally available for households), would you utilize it?

This question is positively answered regardless of company size. More than 40% of companies chose likely, and about 20% chose very likely. All small manufacturing companies chose either likely or very likely while large manufacturing companies did not respond that positively.

Figure 3.12 Willingness To Use Industrial Storage Facility Or Drop-Off Site

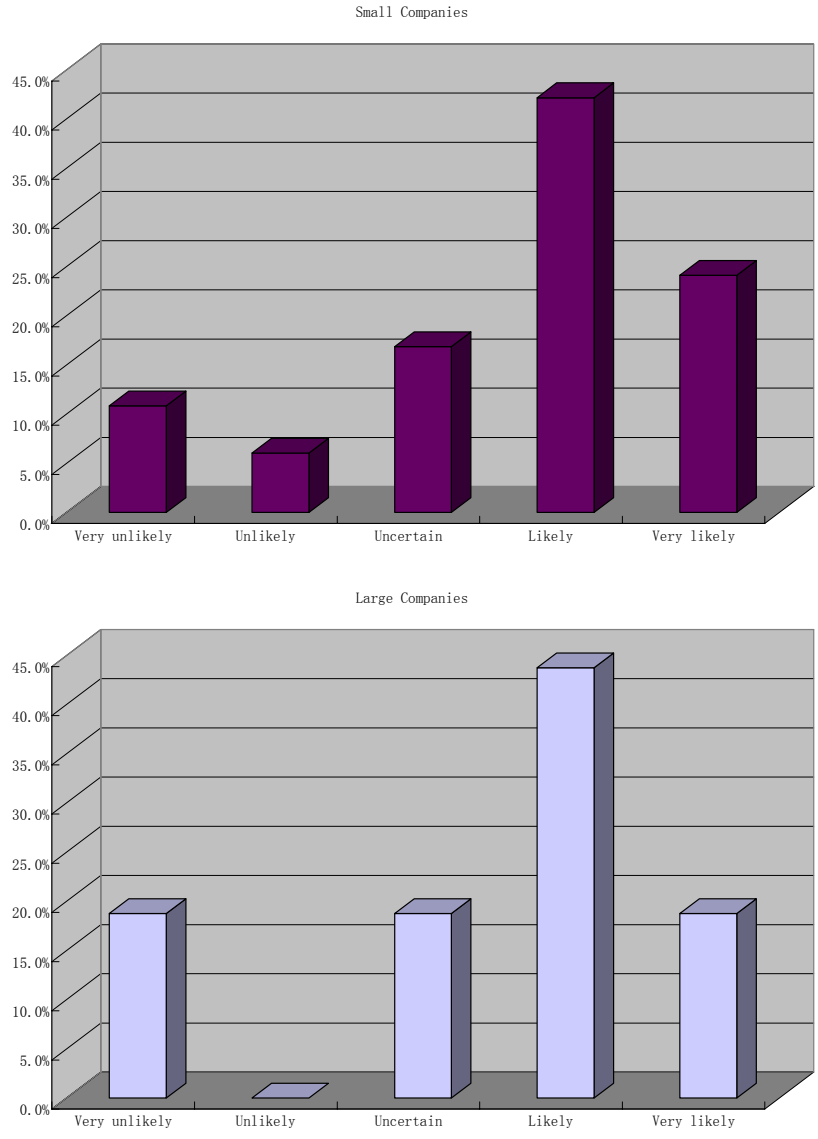


Table 3.16 Willingness To Use Industrial Storage Facility Or Drop-Off Site

	Very Unlikely	Unlikely	Uncertain	Likely	Very Likely
All Small Businesses	10.8%	6.0%	16.9%	42.2%	24.1%
Manufacturing	0.0%	0.0%	0.0%	33.3%	66.7%
Retail	5.6%	11.1%	16.7%	38.9%	27.8%
Services	16.0%	0.0%	12.0%	44.0%	28.0%
All Other	10.5%	7.9%	21.1%	42.1%	18.4%
All Large Businesses	18.8%	0.0%	18.8%	43.8%	18.8%
Manufacturing	25.0%	0.0%	25.0%	25.0%	25.0%
Nonmanufacturing	16.7%	0.0%	16.7%	50.0%	16.7%

Question 18: Who is responsible for recycling and waste management at your business?

The person who received the survey form is responsible for recycling and waste management for most of the small companies. For most of the large companies, someone else is responsible.

Figure 3.13 Person Responsible For Recycling And Waste Management

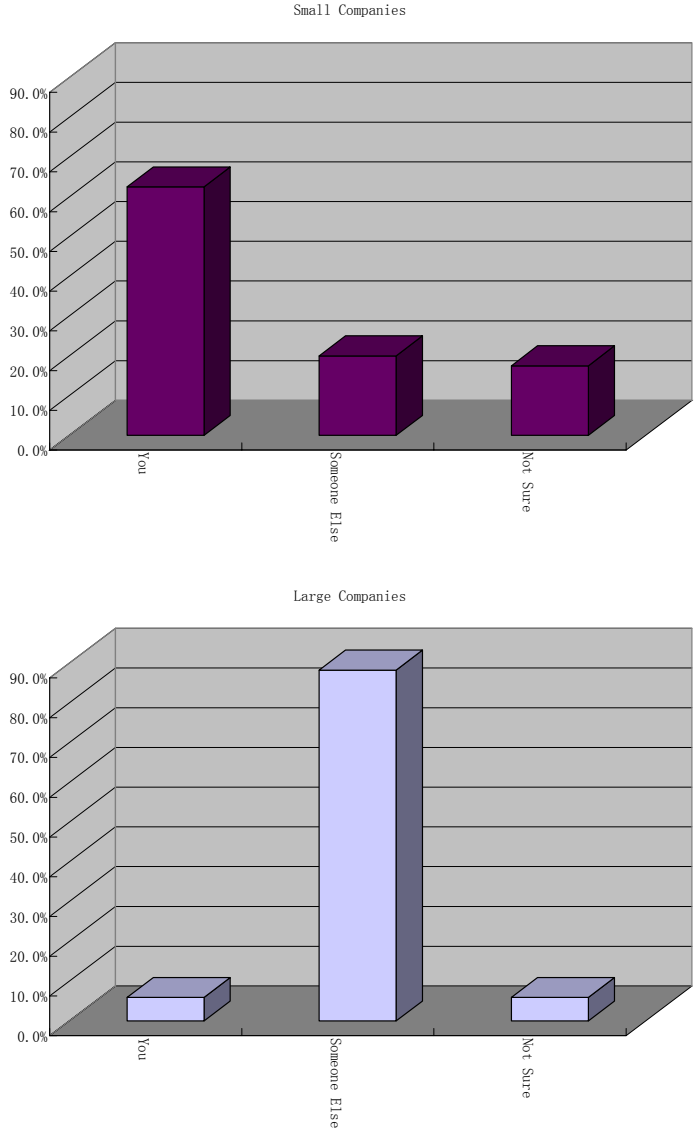


Table 3.17 Person Responsible For Recycling And Waste Management

	You	Someone Else	Not Sure
All Small Businesses	62.5%	20.0%	17.5%
Manufacturing	100.0%	0.0%	0.0%
Retail	56.3%	25.0%	18.8%
Services	78.3%	17.4%	4.3%
All Other	53.8%	20.5%	25.6%
All Large Businesses	5.9%	88.2%	5.9%
Manufacturing	0.0%	80.0%	20.0%
Nonmanufacturing	8.3%	91.7%	0.0%

Question 19: Where do you get information when making recycling and waste reduction decisions?

More of the small companies get information from local government or trash hauler. More of the large companies get information from trash hauler or other business. All small manufacturing companies get information from the internet, a trash hauler, or other businesses.

Figure 3.14 Recycling And Waste Reduction Information Sources

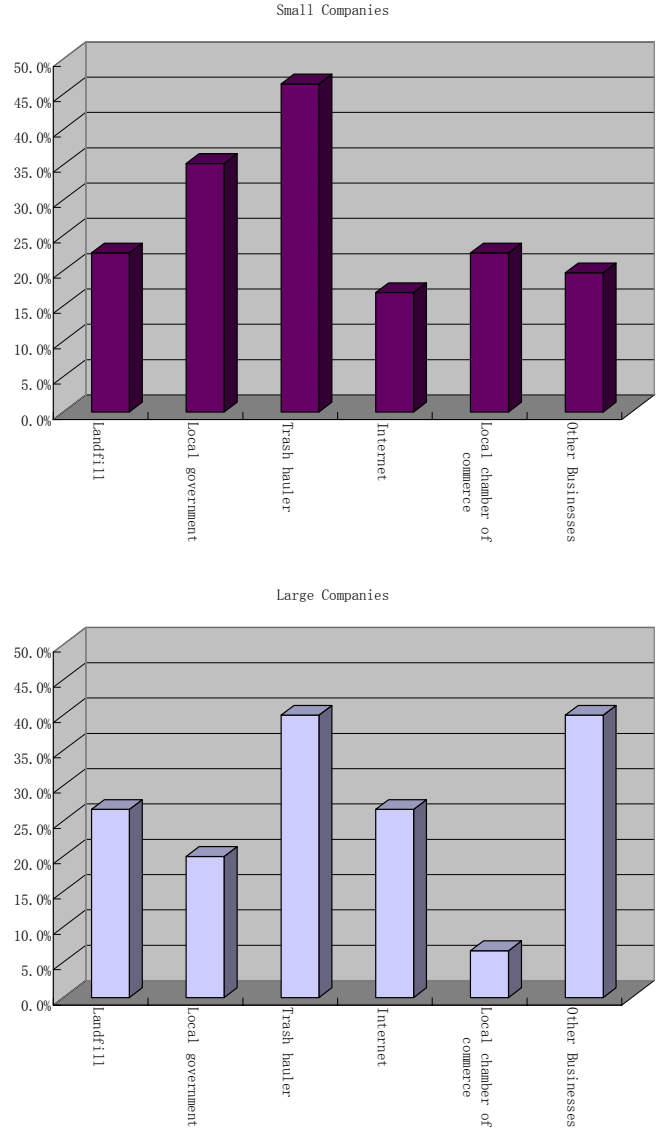


Table 3.18 Recycling And Waste Reduction Information Sources

	Landfill	Local Government	Trash Hauler	Internet	Local Chamber Of Commerce	Other Businesses
All Small Businesses	22.5%	35.2%	46.5%	16.9%	22.5%	19.7%
Manufacturing	33.3%	100.0%	0.0%	33.3%	0.0%	33.3%
Retail	9.1%	27.3%	81.8%	0.0%	9.1%	27.3%
Services	22.7%	31.8%	45.5%	18.2%	22.7%	27.3%
All Other	25.0%	36.1%	38.9%	19.4%	27.8%	13.9%
All Large Businesses	26.7%	20.0%	40.0%	26.7%	6.7%	40.0%
Manufacturing	25.0%	0.0%	50.0%	50.0%	0.0%	50.0%
Nonmanufacturing	27.3%	27.3%	36.4%	18.2%	9.1%	36.4%

Question 20: Do your customers ask about your involvement in the following programs?

For small business, almost all companies answer that their customers do not ask about their involvement in either recycling or reuse programs. For large business, 77% of the companies reported that customers did not ask about either program. Customers asked the rest of the companies about recycling only. None of the manufacturing companies were asked by customers about either program.

Table 3.19 Customers' Concern With Recycling Or Waste Reduction Efforts

	None	Waste Reduction	Recycling	Both
All Small Businesses	91.6%	1.2%	4.8%	2.4%
Manufacturing	100.0%	0.0%	0.0%	0.0%
Retail	96.2%	3.8%	0.0%	0.0%
Services	96.8%	0.0%	3.2%	0.0%
All Other	91.2%	0.0%	5.3%	3.5%
All Large Businesses	76.5%	0.0%	23.5%	0.0%
Manufacturing	100.0%	0.0%	0.0%	0.0%
Nonmanufacturing	69.2%	0.0%	30.8%	0.0%

Question 21: Do you promote your involvement in the following programs to your customers?

88% of the small companies do not promote either of the programs (waste reduction or recycling). 82% of the large companies promote neither waste reduction nor recycling. The rest of large companies promote both. None of the large manufacturing companies promote either waste reduction or recycling.

Table 3.20 Customer Promotion Of Recycling Or Waste Reduction

	None	Waste Reduction	Recycling	Both
All Small Businesses	87.7%	0.0%	6.2%	6.2%
Manufacturing	85.7%	0.0%	14.3%	0.0%
Retail	92.3%	0.0%	3.8%	3.8%
Services	96.7%	0.0%	3.3%	0.0%
All Other	89.3%	0.0%	3.6%	7.1%
All Large Businesses	82.4%	0.0%	0.0%	17.6%
Manufacturing	100.0%	0.0%	0.0%	0.0%
Nonmanufacturing	76.9%	0.0%	0.0%	23.1%

Question 22: Does your business already have the following equipment that is frequently used in recycling?

94% of the small companies don't have a loading dock, while 76% of the large companies do. None of the small manufacturing companies have such equipment, but four-fifths of the large manufacturing companies do.

88% of the small companies lack a fork lift, while two-thirds of the large companies have fork lifts. All large manufacturing companies have fork lifts, while only one-third of small manufacturing companies do. Most of the companies don't have a baler, regardless of company size. None of the small manufacturing companies have such equipment, while 40% of large manufacturers do have it.

Figure 3.15A Business Has Equipment Frequently Used In Recycling: Loading Dock

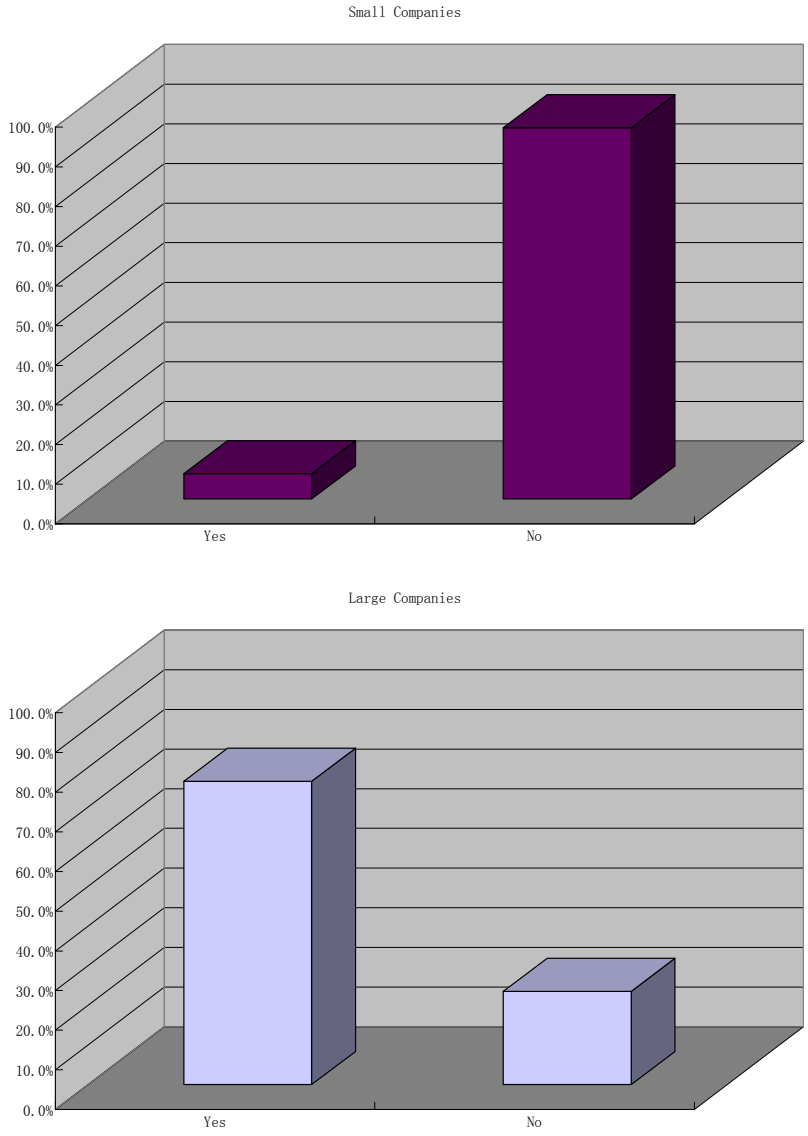


Table 3.21A Business Has Equipment Frequently Used In Recycling: Loading Dock

	Yes	No
All Small Businesses	6.4%	93.6%
Manufacturing	0.0%	100.0%
Retail	5.9%	94.1%
Services	0.0%	100.0%
All Other	10.8%	89.2%
All Large Businesses	76.5%	23.5%
Manufacturing	80.0%	20.0%
Nonmanufacturing	75.0%	25.0%

Figure 3.15B Business Has Equipment Frequently Used In Recycling: A Fork Lift

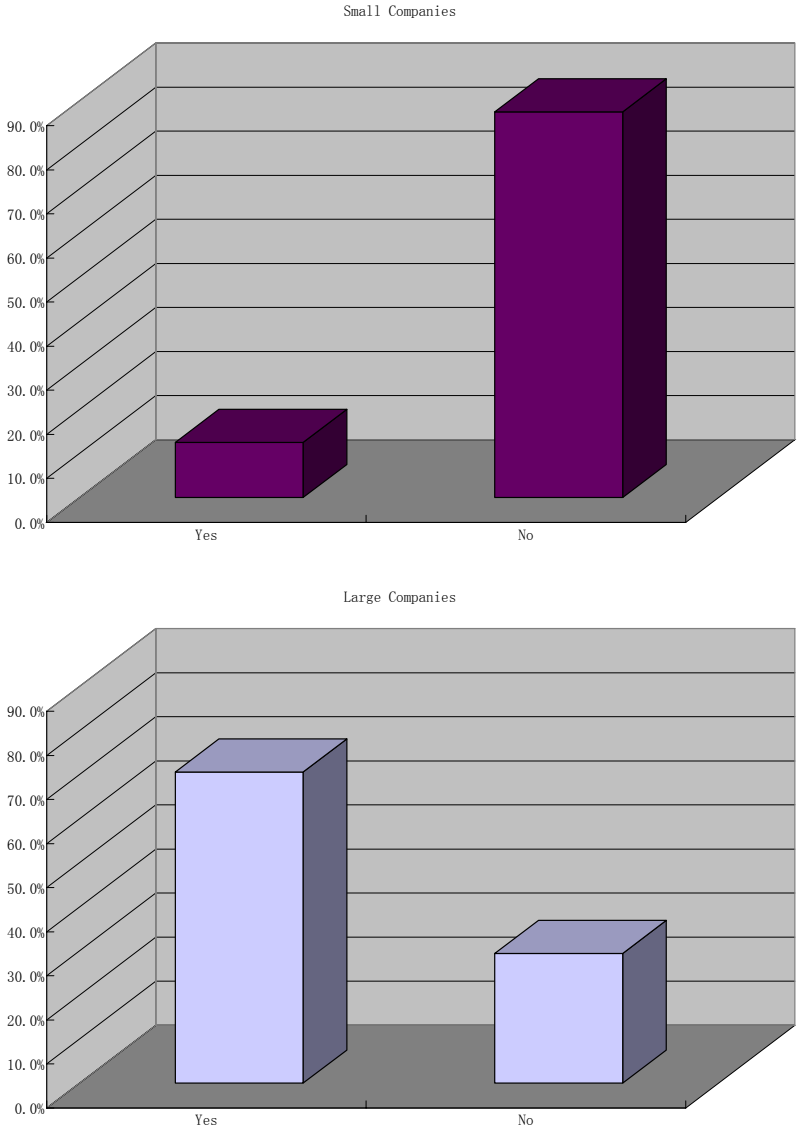


Table 3.21B Business Has Equipment Frequently Used In Recycling: Fork Lift

	Yes	No
All Small Businesses	12.5%	87.5%
Manufacturing	33.3%	66.7%
Retail	11.1%	88.9%
Services	8.7%	91.3%
All Other	13.5%	86.5%
All Large Businesses	70.6%	29.4%
Manufacturing	100.0%	0.0%
Nonmanufacturing	58.3%	41.7%

Figure 3.15C Business Has Equipment Frequently Used In Recycling: Baler

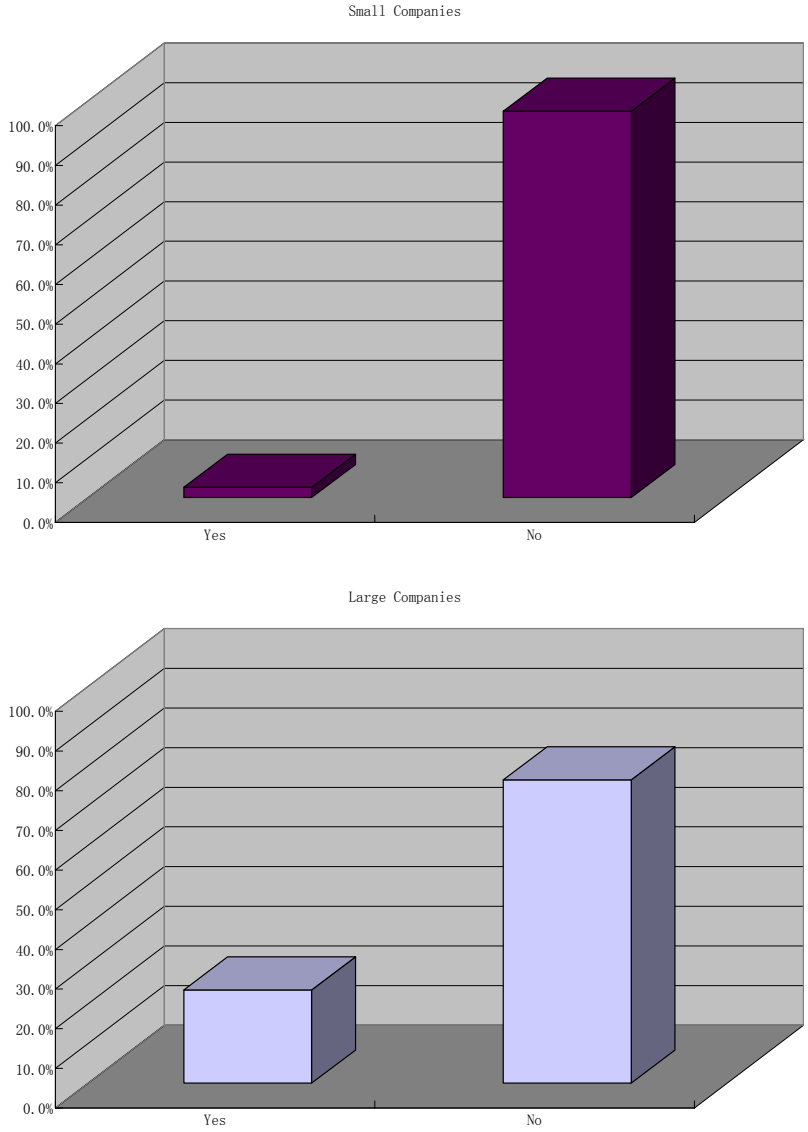


Table 3.21C Business Has Equipment Frequently Used In Recycling: Baler

	Yes	No
All Small Businesses	2.6%	97.4%
Manufacturing	0.0%	100.0%
Retail	5.9%	94.1%
Services	0.0%	100.0%
All Other	2.8%	97.2%
All Large Businesses	23.5%	76.5%
Manufacturing	40.0%	60.0%
Nonmanufacturing	16.7%	83.3%

Question 23: What variables do you use to measure progress in recycling and waste reduction?

Most of the companies said their measures varied (47% for small companies and 54% for large companies). Half of the large manufacturing companies chose gallons of water and 75% chose pounds of material recycled. Half of small manufacturing companies chose pounds of material recycled, while half chose it varies.

Figure 3.16 Variables Used To Measure Recycling And Waste Reduction Progress

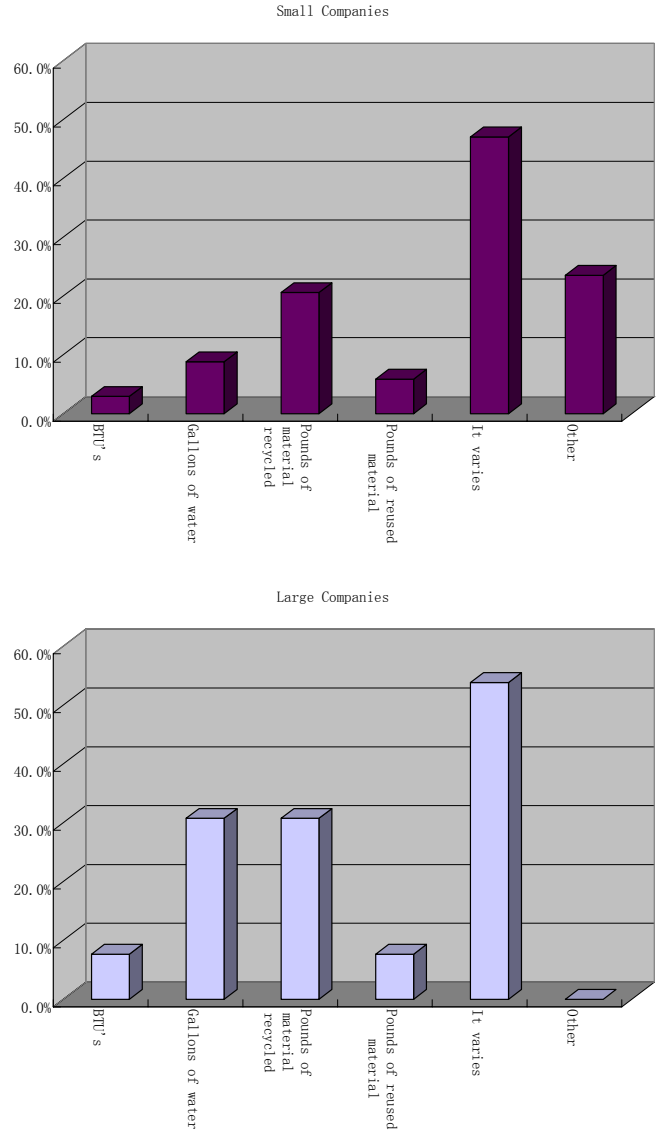


Table 3.22 Variables Used To Measure Recycling And Waste Reduction Progress

	BTU's	Gallons of Water	Pounds of Material Recycled	Pounds of Reused Material	It Varies	Other
All Small Businesses	2.9%	8.8%	20.6%	5.9%	47.1%	23.5%
Manufacturing	0.0%	0.0%	50.0%	0.0%	50.0%	0.0%
Retail	0.0%	12.5%	12.5%	12.5%	62.5%	0.0%
Services	14.3%	14.3%	14.3%	0.0%	42.9%	14.3%
All Other	0.0%	5.9%	23.5%	5.9%	41.2%	5.9%
All Large Businesses	7.7%	30.8%	30.8%	7.7%	53.8%	0.0%
Manufacturing	0.0%	50.0%	75.0%	0.0%	25.0%	0.0%
Nonmanufacturing	11.1%	22.2%	11.1%	11.1%	66.7%	0.0%

Question 24: What do you do with construction and demolition waste?

Most of the small companies chose to discard waste or were not sure. An even smaller share of large companies chose to recycle construction and demolition waste.

Figure 3.17 Current Treatment Of Construction And Demolition Waste

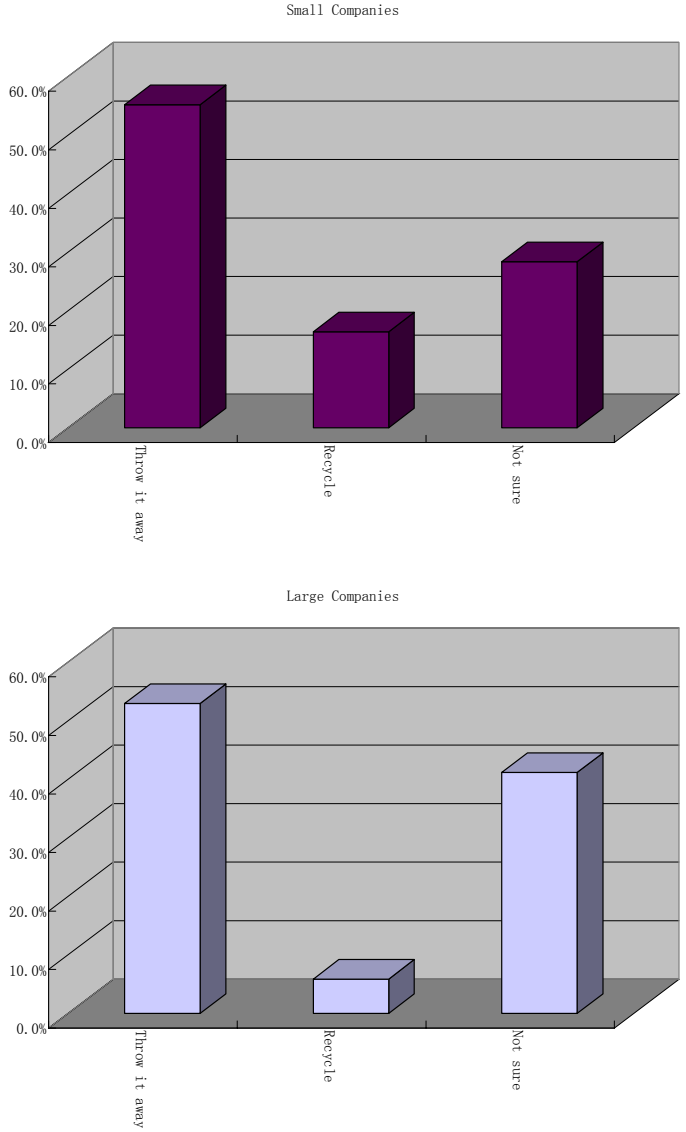


Table 3.23 Current Treatment Of Construction And Demolition Waste

	Throw It Away	Recycle	Not Sure
All Small Businesses	55.2%	16.4%	28.4%
Manufacturing	66.7%	33.3%	0.0%
Retail	46.2%	7.7%	46.2%
Services	75.0%	10.0%	15.0%
All Other	46.9%	21.9%	31.3%
All Large Businesses	52.9%	5.9%	41.2%
Manufacturing	50.0%	16.7%	33.3%
Nonmanufacturing	54.5%	0.0%	45.5%

Question 25: What do you perceive as the main barriers to recycling and reducing waste?

Time and cost are the main barriers for both large and small companies. A lack of markets is an additional barrier for small manufacturing companies.

Figure 3.18 Perceived Barriers To Recycling And Waste Reduction

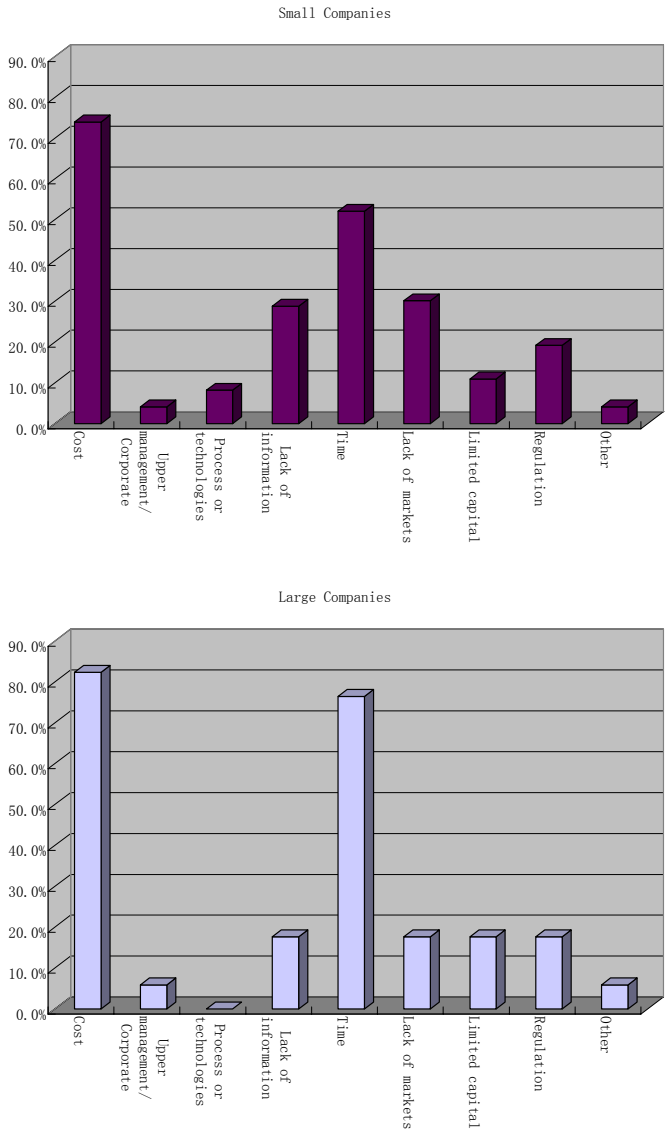


Table 3.24 Perceived Barriers To Recycling And Waste Reduction

	Cost	Upper Management/ Corporate	Process Or Technologies	Lack Of Information	Time	Lack Of Markets	Limited Capital	Regulation	Other
All Small Businesses	74.0%	4.1%	8.2%	28.8%	52.1%	30.1%	11.0%	19.2%	4.1%
Manufacturing	66.7%	0.0%	0.0%	33.3%	66.7%	66.7%	0.0%	0.0%	0.0%
Retail	85.7%	7.1%	0.0%	21.4%	57.1%	35.7%	14.3%	14.3%	0.0%
Services	79.2%	0.0%	12.5%	33.3%	54.2%	37.5%	16.7%	25.0%	4.2%
All Other	66.7%	6.1%	9.1%	30.3%	48.5%	21.2%	6.1%	18.2%	0.0%
All Large Businesses	82.4%	5.9%	0.0%	17.6%	76.5%	17.6%	17.6%	17.6%	5.9%
Manufacturing	80.0%	20.0%	0.0%	0.0%	100.0%	20.0%	0.0%	20.0%	0.0%
Nonmanufacturing	83.3%	0.0%	0.0%	25.0%	66.7%	16.7%	25.0%	16.7%	0.0%

Chapter 4 Findings and Analysis

I. Introduction

The preceding two chapters provided a wealth of detailed information regarding businesses and recycling in Columbus and Grand Island. In this chapter, we identify and discuss the main themes in the responses in Chapter 2 and 3. There is a particular emphasis on discussing findings relevant to identifying additional local business recycling programs and policies for the two cities. The analysis falls into four main sections: Business Attitudes toward Recycling; Materials of Interest, Level of Interest in Innovative Recycling Services; and Barriers to Recycling.

II. Business Attitudes toward Recycling

Attitudes toward recycling and waste reduction differ little between the two cities, but do differ between small and large businesses. Most large businesses consider recycling and waste reduction to be important or very important. Only about one-third of small businesses find recycling and waste reduction to be important. Large manufacturing firms were most likely to answer important or very important. Small manufacturing firms were more likely to mark important or very important than were other small firms.

Similar to the results on the importance of recycling to companies are the responses to reasons for recycling. Environmental stewardship is the top priority for recycling (large = 69% small = 59% in Columbus and large = 63% small = 62% in Grand Island), and the second most common reason for recycling is saving money.

Mirroring the differences in small and large businesses in interest in recycling is the presence of waste reduction programs and of recycling programs. Nearly 55% of the responding small firms in Columbus had neither program, and about 45% of the small Grand Island businesses were lacking both as well. Small manufacturing firms, though, were the least likely to have neither program and most likely to have both. Only 23% of large businesses in Columbus and 10% in Grand Island lacked both programs. All large manufacturing firms had a recycling program, and more than two-thirds had waste reduction programs.

Large and small companies also differed in terms of the steps they were willing to take to participate in recycling programs. Around 40% of large businesses in Columbus were willing to pay recycling fees or purchase equipment to recycle, and close to 60% were willing to devote man-hours to recycling. Smaller firms were much less likely to purchase recycling equipment or pay for fees, but were willing to devote man-hours at a rate of about 25%. While this is a smaller percentage, there were over 1,500 smaller firms in Columbus and over 3,000 in Grand Island. This suggests that hundreds of small companies in each city are willing to devote man-hours to recycling projects.

When asked about customer interest in their recycling programs, small companies from both communities responded at a rate of about 90% that their customers do not ask about the company's programs for waste reduction or recycling. The lack of consumer interest in company waste practices is consistent with a failure of many companies to communicate their programs. Only 5% to 20% of small companies promote

their recycling or waste reduction programs, and most of these promote only their recycling programs. Twice this percentage of large firms promotes their recycling and waste reduction programs.

III. Materials of Interest

A. What Companies are Recycling

The results for the two cities are quite similar in what they recycle. Small companies in both cities recycle office paper, newspaper, cardboard, toner cartridges, and metals at rates between 20% and 30%, some materials being recycled at even higher rates. These items likely reflect, except for metals, the most frequently used items by small businesses. This is especially true of retail and service firms, which represent close to 50% of small firms in both cities. Also, materials such as office paper, newspaper, metals, and cardboard are commonly known to be recyclable materials. It is relatively easy to find ways to recycle them.

Available Responses

Office Paper	Glass	Fluorescent Bulbs	Newspaper
Plastics	Electronics	Magazines	Cardboard
Toner Cartridges	Tires	Metals	Batteries
Wood Waste	Concrete	Chemicals	Carpet
Oils/Lubricants	Other		

When looking at the results for large businesses, it is important to keep in mind the small sample size of large businesses. Large business, in both cities, often recycled those things that small businesses recycled frequently, although at a higher rate. Large businesses also recycled electronics, tires, chemicals, oil and lubricants, and batteries at high rates. The large companies in Columbus, which contained more manufacturing companies, recycled materials such as plastic and wood waste frequently as well.

The stratified large business sample shows that large manufacturing firms (Columbus only) recycle all materials except carpet, concrete, and tires more frequently than do other large businesses. The large proportion of manufacturing businesses located in Columbus likely pushes up the overall large businesses recycling rates for Columbus.

The stratified small business sample shows that small manufacturing firms recycled office paper, metal, oils and lubricants, and electronics more frequently than did small businesses as a whole. Retail firms recycled newspapers, plastics, magazines, cardboard, and batteries more frequently than did small firms as a whole. Service firms recycled glass, newspapers, magazines, and oil and lubricants more than did small firms as a whole.

In a follow-up question, companies were asked to estimate the number of certain devices in use as well as the number they expect to dispose in the next 12 months. The following table summarizes the estimated totals for each community.

Table 4.1 Estimated Number Of Items Disposed By Type And Community

Item	Columbus	Grand Island
Computers	3,100	3,400
Monitors/TVs	2,100	2,900
Printer/Fax	700	600

Copier	100	200
Telephones	500	1,400
Cell Phones	500	700
Handheld Electronics	300	500

Results in Table 4.1 show a substantial annual volume of disposal, with great potential for recycling. Companies also were asked how they dispose the above materials. Computers and monitors/TVs are very likely to be recycled or given away to others by companies. A modest number of companies also recycle printers, telephones, and cellular phones.

Finally, companies also were asked if they recycle or discard their construction and demolition waste. Between 15% and 30% of small companies in both communities recycle their construction and demolition waste. A similar or smaller share of large companies recycles construction waste. One difficulty in recycling construction and demolition waste may be the heterogeneity of the waste and the lack of information provided on recycling the materials.

Finally, it is worth noting that it may be possible in future research to simulate results such as those in Table 4.1 for other communities. Having analyzed the data by firm size and industry, the data from the two towns can help us create similar estimates for other communities based on their industry and firm size characteristics. Such estimates may be an appropriate option when conducting a full survey in other communities is too costly or otherwise not feasible.

B. What Materials Recycling Information Companies Want

Large and small companies differ significantly on the information about recycling they would like to receive. Small companies primarily are interested in information on materials they already recycle. By contrast, large companies seek information that seems uncorrelated with what they already recycle. The Columbus large companies' answers to what information they wanted were nearly opposite that of Grand Island. We hypothesize that small businesses often have similar interest in information on recycling, while large firms desire information proprietary to their venture or industry.

The small companies in both communities responded relatively evenly to the categories presented. Businesses in both communities desired information about recycling office paper, fluorescent bulbs, and electronics most frequently. Cardboard, glass, toner cartridges, batteries, chemicals, newspapers, and plastics were mentioned at rates close to 5%. In Columbus, businesses also wanted information about oils and lubricants. Overall, small companies in both towns seemed most interested in obtaining more information on materials they already recycled. The major exception was fluorescent bulbs. Few small businesses recycle these currently, but nearly 15% had an interest in learning more about opportunities to recycle fluorescent tubes. This 15% represents a substantial number of smaller firms: approximately 200 in Columbus and approaching 500 in Grand Island.

The large companies from Columbus, on the other hand, wanted information on many topics. Plastics, glass, fluorescent bulbs, electronics and magazines were mentioned most frequently, with a response rate of nearly 25%. Office paper, newspaper, and cardboard were also popular materials. One company responded to tires, wood waste, concrete, and chemicals as well.

The stratified results for the small companies revealed that companies across different industries were similar in what type of recycling information they desired.

IV. Level of Interest in Innovative Services

A. Waste Assessment (Free)

Companies in both cities were asked if they would be interested in receiving a one-time free waste assessment. Most companies responded that they were either uncertain, unlikely, or very unlikely to request such an assessment. Most often, if companies were to request such an assessment, they would request information on recycling a specific class of material.

Tables 4.2a Likelihood Of Columbus Companies Requesting Assessment

Columbus	Very Unlikely	Unlikely	Uncertain	Likely	Very Likely
All Small Businesses	55.2%	15.7%	16.3%	7.6%	5.2%
Manufacturing	18.2%	36.4%	18.2%	18.2%	9.1%
Retail	43.3%	16.7%	26.7%	3.3%	10.0%
Services	64.4%	9.6%	17.8%	5.5%	2.7%
All Other	56.9%	19.0%	8.6%	10.3%	5.2%
All Large Businesses	25.0%	25.0%	16.7%	25.0%	8.3%
Manufacturing	14.3%	28.6%	14.3%	28.6%	14.3%
Nonmanufacturing	40.0%	20.0%	20.0%	20.0%	0.0%

Tables 4.2b Likelihood Of Grand Island Companies Requesting Assessment

Grand Island	Very Unlikely	Unlikely	Uncertain	Likely	Very Likely
All Small Businesses	51.6%	20.8%	16.7%	8.1%	2.7%
Manufacturing	33.3%	22.2%	33.3%	11.1%	0.0%
Retail	58.8%	21.6%	17.6%	2.0%	0.0%
Services	60.4%	18.9%	9.4%	7.5%	3.8%
All Other	45.0%	21.1%	18.3%	11.9%	3.7%
All Large Businesses	27.8%	16.7%	38.9%	16.7%	0.0%
Manufacturing	33.3%	0.0%	33.3%	33.3%	0.0%
Nonmanufacturing	25.0%	25.0%	41.7%	8.3%	0.0%

The interest in a one-time waste assessment was minimal in both towns among small businesses. Nearly 50% of small company respondents, in both Columbus and Grand Island, answered that they were very unlikely to request such an assessment. Roughly 10% of small companies responded with likely or very likely. If the companies were to request such an assessment, they would like information on recycling specific materials, on improving their waste program, and on disposing electronic equipment. Service and retail industries were much more likely to respond that they were very unlikely to request such an assessment.

Large companies in Columbus had a nearly even distribution of answers between very unlikely, unlikely, uncertain, and likely, but few chose very likely. In Grand Island, all but 17% of large businesses responded uncertain, unlikely, or very unlikely. If companies were to request an assessment, they would be likely to request information on establishing or improving their waste process or recycling a specific

class of material. At least a few large companies responded positively to every other category given (reducing scrap rate, conducting energy efficiency studies, disposing of electrical equipment, and conserving water).

Once again, while this service does not appear to be popular based on the brief information the companies were provided, they are most interested in recycling specific classes of materials and establishing or improving their waste system. Even with a small percentage of firms likely (10% of small and 15% to 30% of large), this percentage represent hundreds of businesses in communities the size of Columbus and Grand Island

B. Bulbs and Monitors

Companies were relatively receptive to recycling bulbs and monitors. Nearly 20% of small businesses in both communities were likely or very likely to be willing to pay the $10 to $15 per monitor and $.60 per bulb to properly recycle them. Looking at both cities by small business industry, there are no specific industries that differ much in response to this question. If we refer to the information companies would like to receive on recycling, fluorescent bulbs was the number one response by small companies in both cities.

In Columbus, over 50% of large businesses were very likely to be willing to pay for bulb and monitor recycling. One-third of large Grand Island companies marked very likely to pay or likely to pay those amounts. In both towns, large manufacturing firms were the most likely of all businesses to pay for these services, but there was interest at all business sizes and in all sectors.

Tables 4.3a Likelihood Of Columbus Companies Paying For Bulb/Monitor Recycling

Columbus	Very Unlikely	Unlikely	Uncertain	Likely	Very Likely
All Small Businesses	38.4%	19.2%	23.8%	14.5%	4.1%
Manufacturing	30.0%	0.0%	60.0%	10.0%	0.0%
Retail	29.0%	25.8%	25.8%	19.4%	0.0%
Services	51.4%	16.7%	15.3%	9.7%	6.9%
All Other	28.8%	22.0%	27.1%	18.6%	3.4%
All Large Businesses	16.7%	16.7%	16.7%	8.3%	41.7%
Manufacturing	14.3%	14.3%	0.0%	14.3%	57.1%
Nonmanufacturing	20.0%	20.0%	40.0%	0.0%	20.0%

Tables 4.3b Likelihood Of Grand Island Companies Paying For Bulb/Monitor Recycling

Grand Island	Very Unlikely	Unlikely	Uncertain	Likely	Very Likely
All Small Businesses	35.2%	16.9%	29.6%	15.0%	3.3%
Manufacturing	33.3%	11.1%	22.2%	22.2%	11.1%
Retail	44.9%	10.2%	34.7%	8.2%	2.0%
Services	37.3%	13.7%	29.4%	17.6%	2.0%
All Other	29.5%	21.9%	28.6%	16.2%	3.8%
All Large Businesses	41.2%	5.9%	17.6%	23.5%	11.8%
Manufacturing	20.0%	0.0%	0.0%	40.0%	40.0%
Nonmanufacturing	50.0%	8.3%	25.0%	16.7%	0.0%

C. Waste Assessment Service

In addition to being asked about a free waste assessment, companies also were asked about their willingness to pay for a resource management consultation service. Each company was asked how willing it would be to pay at a certain amount, but the hypothetical amount asked varied. In aggregate for both communities, only four of 62 businesses responded that they would be likely or very likely to pay $500 for such a service and only two companies were likely or very likely to pay at the $1000 or $2000 level. None responded likely or very likely at $3000, and only two firms (both of which were large) responded positively at $5000.

Table 4.4 Responses To Waste Assessment Service

Both Communities	Surveys	Likely	% Likely
$500	62	4	6.45%
$1000	93	2	2.15%
$2000	96	2	2.08%
$3000	108	0	0.00%
$5000	55	2	3.64%

Given the low response rates even at $500, which is a nominal number for large manufacturing companies who spend large amounts of time and resources working with waste and recycling and the even fewer responses at higher prices, we believe that the service, at any reasonable cost, is not in high demand. Yet the two responses at $5000 lead us to believe that people who want this service are willing to pay a significant amount for it.

V. Barriers to Recycling

Previous sections dealt with demand among responding businesses for a variety of specific recycling services. The survey, however, also asked more general questions about factors that businesses identified as being substantial barriers to recycling (Q25). These responses also would point to some potential policies for encouraging recycling in the two communities. Table 4.5 summarizes responses to this question in the two cities. The table focuses on the most common responses. Manufacturers less frequently believed that cost was a barrier to recycling. This was true for both large and small businesses as well as for Columbus and for Grand Island. Complete information on the responses is available in Chapters 2 and 3.

The most common responses regarding barriers for either small or large businesses in either of the two cities were the related factors of cost and time. The cost response is not unexpected, given that businesses constantly must monitor cost issues. Further, the link to local recycling policy is unclear, as it naturally would be a useful idea to reduce recycling costs. The time response is potentially more interesting, particularly given respondent answers to several other questions in the survey. In question 11, many respondents indicated a willingness to spend their own time to recycle (but were unwilling to purchase equipment or pay recycling fees). In question 17, more than half of small and large companies indicated that they would utilize a storage facility or drop-off site for recycled materials (beyond what is already available for households). Together, these results suggest that programs to minimize the time commitment of businesses to recycling by making drop-off sites for recycled material more readily available in the two communities would generate much local use.

This local policy suggestion is likely the main one identified in this general analysis of the barriers to recycling. Earlier in this chapter we detail the issue of lack of information. Section III of this chapter suggested areas where businesses require additional information about recycling options. At the same time, the high response regarding a lack of markets suggests a statewide effort to develop recycling markets that serve smaller and mid-size cities would have merit.

Table 4.5 Significant Barriers To Recycling

City	Company Size	Cost	Time	Lack of Information	Lack of Markets
Columbus	Small	53%	40%	26%	26%
Columbus	Large	62%	46%	15%	69%
Grand Island	Small	74%	52%	29%	30%
Grand Island	Large	82%	77%	18%	18%

Source: Question 25, Chapters 2 and 3

VI. Summary

This analysis of the two surveys found that responses were fairly consistent across both cities, but did differ by size of business. In particular, large businesses were more likely to recycle and recycled more types of materials. In addition to seeking material on the commonly recycled materials that small businesses did, large businesses were more likely to seek information on recycling for the following materials: plastics, glass, fluorescent bulbs, electronics, and magazines. Large businesses also were much more likely to have an interest in having a waste assessment. Both small and large businesses showed significant interest in opportunities to recycle fluorescent bulbs and computer monitors at a reduced cost, though percentages were somewhat higher for large businesses.

There was little difference among companies regarding the general barriers to recycling, with both large and small businesses interested in reducing the time required to recycle. Together the results suggested at least three types of potential approaches for local recycling efforts:

1) Providing additional information about recycling to businesses in general for the following materials: plastics, glass, fluorescent bulbs, cardboard, magazines, office paper, metals, and toner cartridges.
2) Provide increased access and information on the costs and benefits of recycling bulbs and monitors and increasing options for recycling construction materials.
3) Increase the access and visibility of recycling drop off centers to businesses; communicate ease and access of facilities as well as all the materials that are accepted.

Appendix 1 The Long Form

UNL Bureau of Business Research/WasteCap Nebraska Recycling and Waste Reduction Needs Survey

(please return to: University of Nebraska—Lincoln, Bureau of Business Research,
347 College of Business Administration, P.O. Box 880406, Lincoln, NE 68501-9988)

Instructions

Please complete this survey by September 7, 2005 from the point of view of your business. We recognize that your time is a valuable asset, so the survey is limited to just three pages. Your participation is vital to the accuracy and robustness of our results. Use the following definitions in answering the survey:

Recycling: separating waste for reprocessing rather than disposal.
Waste Reduction: avoiding the creation of waste.

1) Please mark the category that best describes your business.

☐ Wholesale ☐ Government ☐ Services
☐ Retail ☐ Non-Profit ☐ Manufacturing
☐ Construction ☐ Restaurants & Accommodations
☐ General Office ☐ Other _____

2) How many people are employed by your business at your location?

☐ 20 or fewer ☐ 20 – 49 ☐ 50 – 99 ☐ 100 – 249 ☐ 250 – 499 ☐ 500 or more

3) How important is recycling and waste reduction to your business?

☐ Not important ☐ Slightly important ☐ Somewhat important ☐ Important ☐ Very important

4) What would be your priorities for participating in waste reduction and/or recycling?

☐ Saving money
☐ Safety of employees
☐ Reduced regulatory burden
☐ Environmental stewardship
☐ Image of business
☐ Other (please specify) _____

5) Does your business currently have a waste reduction program?

☐ Yes ☐ No ☐ Not Sure

6) Does your business currently have a recycling program?

☐ Yes ☐ No ☐ Not Sure

7) Which of the following does your company currently recycle?

☐ Office Paper ☐ Glass ☐ Fluorescent Bulbs
☐ Newspaper ☐ Plastic ☐ Electronics
☐ Magazines ☐ Cardboard ☐ Toner Cartridges
☐ Tires ☐ Metals ☐ Batteries
☐ Wood Waste ☐ Concrete ☐ Chemicals
☐ Carpet ☐ Other (specify)_____

8) For which materials options would you like more information about recycling?

☐ Office Paper	☐ Glass	☐ Fluorescent Bulbs
☐ Newspaper	☐ Plastic	☐ Electronics
☐ Magazines	☐ Cardboard	☐ Toner Cartridges
☐ Tires	☐ Metals	☐ Batteries
☐ Wood Waste	☐ Concrete	☐ Chemicals
☐ Carpet	☐ Other (specify)_____	

9) Please ESTIMATE how many of the following are in use at your company and how many you anticipate disposing in the next 12 months.

	Number Currently in Use	Number You Anticipate Disposing in Next 12 Months
a. Computers (PCs, Servers, Laptops)	_____	_____
b. Monitors/TVs	_____	_____
c. Printers/Fax Machines	_____	_____
d. Copiers	_____	_____
e. Telephones (Not Cellular)	_____	_____
f. Cell Phones	_____	_____
g. Handheld Electronics	_____	_____

10) How do you currently dispose of those items?

	Work With Recycling Company	Donate to Schools or Charities	Give to Employees	Other
a. Computers (PCs, Servers, Laptops)	☐	☐	☐	☐
b. Monitors/TVs	☐	☐	☐	☐
c. Printers/Fax Machines	☐	☐	☐	☐
d. Copiers	☐	☐	☐	☐
e. Telephones (Not Cellular)	☐	☐	☐	☐
f. Cell Phones	☐	☐	☐	☐
g. Handheld Electronics	☐	☐	☐	☐

If you selected Other for any item, please explain _____

_____

11) Is your company willing to get involved in recycling if it will require: (Please answer a, b, and c below.)

a. Spending money for equipment	☐ Yes	☐ No	☐ Not Sure
b. Spending money for recycling fees	☐ Yes	☐ No	☐ Not Sure
c. Employee (or your own) man-hours	☐ Yes	☐ No	☐ Not Sure

12) An on-site waste assessment is a one-time evaluation to determine opportunities for waste reduction and recycling. Would you be interested in a no cost, confidential waste assessment?

☐ Very unlikely to request an assessment
☐ Unlikely to request an assessment
☐ Uncertain about requesting an assessment
☐ Likely to request an assessment
☐ Very likely to request an assessment

13) Which technical skills would you want in an assessor?

☐ Economic ☐ Engineering ☐ Regulatory ☐ Hazardous Materials ☐ Environmental

14) For which of the following topics would you request assistance? (Check all that apply.)

☐ Scrap rate
☐ Energy efficiency
☐ Dispose of electronic equipment
☐ Recycling
☐ Set up or improve a waste reduction program
☐ Other (please specify) _____

15) It can cost $10-$15 per monitor and close to $0.60 per fluorescent bulb to recycle. Are you willing to pay this amount to dispose of monitors and fluorescent bulbs properly?

☐ Very unlikely to pay this amount
☐ Unlikely to pay this amount
☐ Uncertain about paying this amount
☐ Likely to pay this amount
☐ Very likely to pay this amount

16) Resource management is an ongoing consulting service that helps businesses save money by increasing recycling and lowering garbage hauling fees. Would you be interested in paying for this service if it cost $1000 for one year of service?

☐ Very unlikely to pay for the service
☐ Unlikely to pay for the service
☐ Uncertain about paying for the service
☐ Likely to pay for the service
☐ Very likely to pay for the service

17) If your community had a storage facility or drop-off site for recyclable materials (beyond what is generally available for households), would you utilize it?

☐ Very unlikely to utilize it
☐ Unlikely to utilize it
☐ Uncertain about utilizing it
☐ Likely to utilize it
☐ Very likely to utilize it

18) Who is responsible for recycling and waste management at your business?

☐ You ☐ Someone Else (list job title)_____ ☐ Not Sure

19) How do you gather information when making recycling and waste reduction decisions? (Check all that apply.)

☐ Landfill ☐ Local government ☐ Trash Hauler
☐ Internet ☐ Local Chamber of Commerce ☐ Other businesses

Recall the definitions of recycling and waste reduction from page 1:

Recycling: separating waste for reprocessing rather than disposal.
Waste Reduction: avoiding the creation of waste.

20) Do your customers ask about your involvement in the following programs?

a. Waste Reduction ☐ Yes ☐ No ☐ Not Sure
b. Recycling ☐ Yes ☐ No ☐ Not Sure

21) Do you promote your involvement in the following programs to your customers?

a. Waste Reduction ☐ Yes ☐ No ☐ Not Sure
b. Recycling ☐ Yes ☐ No ☐ Not Sure

22) Does your business already have the following equipment that is frequently used in recycling?

a. A loading dock ☐ Yes ☐ No
b. A fork lift ☐ Yes ☐ No
c. A baler ☐ Yes ☐ No

23) What variables do you use to measure progress in recycling and waste reduction? (Check all that apply.)

☐ BTUs ☐ Gallons of water
☐ Pounds of recycled material ☐ Pounds of reused material
☐ Varies with the Situation ☐ Other (please specify)_____

24) What do you do with construction and demolition waste?

☐ Throw away ☐ Recycle ☐ Not Sure

25) What do you perceive as the main barriers to recycling and reducing waste? (Check all that apply.)

☐ Cost ☐ Upper Management / Corporate Office
☐ Process or technologies ☐ Lack of information
☐ Time ☐ Lack of markets
☐ Other (please specify)_____

26) Are there materials specific to your industry that have not been addressed on this survey?

_____

_____

_____

OPTIONAL: Please complete the following if you would like more information about recycling and waste disposal options.

Company Name_____

Contact Name _____

Telephone Number _____ **Email Address** _____

Appendix 2 The Short Form

UNL Bureau of Business Research/WasteCap Nebraska Recycling and Waste Reduction Needs Survey

(please return to: University of Nebraska—Lincoln, Bureau of Business Research,
347 College of Business Administration, P.O. Box 880406, Lincoln, NE 68501-9988)

Instructions

Please complete this survey by September 7, 2005 from the point of view of your business. We recognize that your time is a valuable asset, so the survey is limited to just two pages. Your participation is vital to the accuracy and robustness of our results. Use the following definitions in answering the survey:

Recycling: separating waste for reprocessing rather than disposal.
Waste Reduction: avoiding the creation of waste.

1) Please mark the category that best describes your business.

☐ Wholesale ☐ Government ☐ Services
☐ Retail ☐ Non-Profit ☐ Manufacturing
☐ Construction ☐ Restaurants & Accommodations
☐ General Office ☐ Other _____

2) How many people are employed by your business at your location?

☐ 20 or fewer ☐ 20 – 49 ☐ 50 – 99 ☐ 100 – 249 ☐ 250 – 499 ☐ 500 or more

3) How important is recycling and waste reduction to your business?

☐ Not important ☐ Slightly important ☐ Somewhat important ☐ Important ☐ Very important

4) What would be your priorities for participating in waste reduction and/or recycling?

☐ Saving money
☐ Safety of employees
☐ Reduced regulatory burden
☐ Environmental stewardship
☐ Image of business
☐ Other (please specify) _____

5) Does your business currently have a waste reduction program?

☐ Yes ☐ No ☐ Not Sure

6) Does your business currently have a recycling program?

☐ Yes ☐ No ☐ Not Sure

7) Which of the following does your company currently recycle?

☐ Office Paper ☐ Glass ☐ Fluorescent Bulbs
☐ Newspaper ☐ Plastic ☐ Electronics
☐ Magazines ☐ Cardboard ☐ Toner Cartridges
☐ Tires ☐ Metals ☐ Batteries
☐ Wood Waste ☐ Concrete ☐ Chemicals
☐ Carpet ☐ Other (specify)_____

8) For which materials options would you like more information about recycling?

☐ Office Paper ☐ Glass ☐ Fluorescent Bulbs
☐ Newspaper ☐ Plastic ☐ Electronics
☐ Magazines ☐ Cardboard ☐ Toner Cartridges
☐ Tires ☐ Metals ☐ Batteries
☐ Wood Waste ☐ Concrete ☐ Chemicals
☐ Carpet ☐ Other (specify)_____

9) Please ESTIMATE how many of the following are in use at your company and how many you anticipate disposing in the next 12 months.

	Number Currently in Use	Number You Anticipate Disposing in Next 12 Months
a. Computers (PCs, Servers, Laptops)	_____	_____
b. Monitors/TVs	_____	_____
c. Printers/Fax Machines	_____	_____
d. Copiers	_____	_____
e. Telephones (Not Cellular)	_____	_____
f. Cell Phones	_____	_____
g. Handheld Electronics	_____	_____

10) How do you currently dispose of those items?

	Work With Recycling Company	Donate to Schools or Charities	Give to Employees	Other
a. Computers (PCs, Servers, Laptops)	☐	☐	☐	☐
b. Monitors/TVs	☐	☐	☐	☐
c. Printers/Fax Machines	☐	☐	☐	☐
d. Copiers	☐	☐	☐	☐
e. Telephones (Not Cellular)	☐	☐	☐	☐
f. Cell Phones	☐	☐	☐	☐
g. Handheld Electronics	☐	☐	☐	☐

If you selected Other for any item, please explain _____

_____

11) Is your company willing to get involved in recycling if it will require: (Please answer a, b, and c below.)

a. Spending money for equipment	☐ Yes	☐ No	☐ Not Sure
b. Spending money for recycling fees	☐ Yes	☐ No	☐ Not Sure
c. Employee (or your own) man-hours	☐ Yes	☐ No	☐ Not Sure

12) An on-site waste assessment is a one-time evaluation to determine opportunities for waste reduction and recycling. Would you be interested in a no cost, confidential waste assessment?

☐ Very unlikely to request an assessment
☐ Unlikely to request an assessment
☐ Uncertain about requesting an assessment
☐ Likely to request an assessment
☐ Very likely to request an assessment

13) If you were to have an on-site waste assessment, which of the following topics would you request assistance? (Check all that apply.)

☐ Scrap rate
☐ Energy efficiency
☐ Dispose of electronic equipment
☐ Recycling
☐ Set up or improve a waste reduction program
☐ Other (please specify) _____

14) It can cost $10-$15 per monitor and close to $0.60 per fluorescent bulb to recycle. Are you willing to pay this amount to dispose of monitors and fluorescent bulbs properly?

☐ Very unlikely to pay this amount
☐ Unlikely to pay this amount
☐ Uncertain about paying this amount
☐ Likely to pay this amount
☐ Very likely to pay this amount

15) Resource management is an ongoing consulting service that helps businesses save money by increasing recycling and lowering garbage hauling fees. Would you be interested in paying for this service if it cost $1000 for one year of service?

☐ Very unlikely to pay for the service
☐ Unlikely to pay for the service
☐ Uncertain about paying for the service
☐ Likely to pay for the service
☐ Very likely to pay for the service

OPTIONAL: Please complete the following if you would like more information about recycling and waste disposal options.

Company Name_____

Contact Name _____

Telephone Number _____ **Email Address** _____

Appendix 3 Participants

April Pre-Test Participants

Steve Dolezal – Joe & Al's Grocery
Steve Homan – S&D Metal Recycling
Rich Bergland – Electric Fixture and Supply
Kevin Johnson – Wize Buys Carpet (Downtown Business Assoc.)
Carl Edwards – Columbus Recycling Center
Nicole Cyza – Becton Dickenson
Carla Gaunt – Vishay Dale Electronics
Steve Andrews – Nebraska State Recycling Association
Heather Buttaro – Keep Columbus Beautiful

February Stakeholders Meeting Participants

Carrie Hakenkamp – WasteCap
Heather Buttaro – Keep Columbus Beautiful
Ralph Martin – LLCHD
Tim Richter – Omaha Paper Stock
Cecil Steward – JCI
Terry Wendlandt – Cartridges for Kids
Tonya Bernadt – WasteCap
Stacey Hawkey – UNL P3
Ken Cooper – Midland
Cindy Miesbach – NDEQ
Rick Yoder – P2RX