

# EMPLOYMENT TRENDS IN NORTH CAROLINA'S RECYCLING INDUSTRY – 2010



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# **Employment Trends in North Carolina's Recycling Industry -- 2010**

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NOTE: In 2010, the N.C. General Assembly combined the former DENR Customer Service Center and the Division of Pollution Prevention and Environmental Assistance into one agency: the Division of Environmental Assistance and Outreach.

## EMPLOYMENT TRENDS IN NORTH CAROLINA'S **RECYCLING INDUSTRY** – 2010

### Executive Summary

This report presents findings from an employment study of recycling businesses in North Carolina in 2010. More than 630 private sector recycling businesses were surveyed and researched for employment data. The major findings include:

- There are currently almost 15,200 private sector recycling-related jobs in North Carolina.
- Private sector recycling jobs have increased 4.8 percent since 2008.
- Total annual payroll for North Carolina recycling businesses is \$395 million.
- Forty-eight percent of recycling businesses surveyed anticipate creating more jobs during the next two years.
- Twenty-five percent of businesses surveyed report manufacturing a product using recycled materials.
- Recycling businesses target a wide variety of recyclables for collection, processing or use in manufacturing. No single recycling commodity dominates the sector.

### Background

From April 2010 through November 2010, the Recycling Business Assistance Center in the N.C. Division of Environmental Assistance and Outreach conducted a recycling business jobs survey to determine a current estimate of private sector recycling-related employment in North Carolina. The study was a follow-up to previous studies conducted in 1994, 2000, 2004 and 2008.

### Methodology

For this study a *recycling business* was defined as a company involved in the recovery, reuse or remanufacture of materials. This included the collection, processing, manufacturing, reuse or composting of post-consumer or post-industrial materials. A *recycling-related employee* was defined as an employee who dedicates any time to recycling-related activities or whose position would not exist without the recycling component of the business. To avoid overestimating full-time employment, businesses were asked to calculate the full-time equivalency of a part-time employee by dividing the part-time employee's average weekly hours by 40.

### Study Bounds

Since the goal of the research was to accurately quantify the number of private sector recycling-related jobs in North Carolina, only material flows and jobs that occur within the state borders were considered. The study only included direct economic impacts and excluded indirect or induced measurements. Therefore, businesses such as recycling equipment manufacturers and distributors were excluded.

### Data Collection

*Primary Data.* The Recycling Business Assistance Center maintains a free, online Recycling Markets Directory of recycling companies that collect, transport, broker, process or remanufacture recovered materials in North Carolina. This directory provides essential links between businesses, industries and local governments searching for markets for recyclables and

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the companies that accept the materials for recovery. While the RMD includes national markets in addition to North Carolina-based markets, only North Carolina companies were surveyed for this study (in addition to the North Carolina-based locations of national companies).

Every recycling business or organization in North Carolina listed in the RMD received the recycling business survey. The primary data sample included 632 North Carolina-based recycling business operations.

*Business Survey Design.* Survey Monkey™ was the online tool used for the study. Questions from previous recycling employment studies were modified for integration into the online survey tool. In addition to recycling employment questions, the survey also included recycling tonnages, recyclable materials and hourly wage questions. Recycling businesses with e-mail addresses received an e-mail including instructions, a password and a company identification number to ensure respondent confidentiality.

A printed copy of the survey, a cover letter with instructions and a pre-addressed stamped envelope for the completed survey were also sent by mail to companies without e-mail addresses.

*Business Survey Implementation.* All 632 recycling businesses received an invitation to participate in the 2010 Recycling Business Employment Study update. Businesses with e-mail received a link to the survey in May 2010. Companies that did not respond to the initial web-based survey invitation were sent an additional e-mail notice in June. The survey was closed on July 1, 2010. Data from responders was collected and stored.

Businesses without e-mail addresses were mailed the printed survey in mid-May with instructions and a pre-labeled self-addressed stamped envelope. Staff in the N.C. Division of Environmental Assistance and Outreach entered returned surveys manually into the online survey instrument.

Unresponsive businesses were placed on a list to obtain data via secondary data sources or to obtain employment data only by direct phone call to the business. Other survey questions were not addressed during this data collection effort.

*Secondary Data: Recycling Employment.* Two secondary sources of employment data were used for this study: (1) the N.C. Employment Security Commission database, and (2) the online Harris Directory database, Selectory. The ESC database lists company names, North American Industry Classification System (NAICS) code classifications, employment and addresses for North Carolina businesses as reported in the third quarter of 2009. Operated by Dun & Bradstreet, the online Harris Directory, Selectory, is a comprehensive database of company profiles in the United States, including numbers of employees.

Unresponsive businesses from the Recycling Business Survey were queried for employment data only with these two secondary databases. Once the overall employment number was obtained for each business, industry experts in DEAO estimated the percentage of recycling-related employees.

*Additional Data.* While the Recycling Markets Directory is a great resource for recycling-related businesses, it is not inclusive. Not every recycling business in the state has chosen to list itself in the directory. Some business may not be aware that the RMD exists and RBAC staff may not be aware of every recycling business in the state. Finally, some manufacturers who rely on recycled feedstocks may not self-list in the RMD because they already have established supplies of materials and do not need the directory listing to help source additional supplies. With access to the ESC database, there was an opportunity to find other recycling companies not listed in the RMD, such as recycled-material dependent manufacturers, and to gather additional employment data for the study.

The N.C. ESC dataset included NAICS codes for each business listing. As there is no general classification number for the recycling industry, the ESC database was queried for a variety of classification codes used by various recycling-related sectors. Those included NAICS code 423930 (Recyclable Material Merchant Wholesalers), NAICS code 321920 (Container and Pallet Manufacturing) and NAICS code 562111 (Waste Haulers). A general query for “recycling” or “recycle” in the company name field was also performed. Businesses identified were checked against RMD companies to avoid double-counting. Based on industry input and staff experience with the two sectors, it was assumed that 10 percent of total employment for NAICS code 321920 (Waste Haulers) and 66 percent employment of NAICS code 321920 (Container and Pallet Manufacturing) was dedicated to recycling

From staff contact and interaction, 20 additional recycled-content manufacturing companies not listed in the RMD were included in the study. Many of these businesses were featured in previous publications, “Recycling Means Business,” and “Made in N.C.,” written by RBAC staff. Employment data for these companies was obtained from the ESC database. To avoid overestimating recycling employment data, industry experts in RBAC estimated the percentage of recycling-related employees.

### Recycling Business Survey Results

Like the 2008 employment study, the 2010 recycling employment update made a significant effort to obtain real employment data from primary and secondary sources instead of extrapolating data to estimate a statewide recycling employment figure. The primary study sample included 632 North Carolina businesses listed in the RMD. Of the 632 businesses surveyed, 213 responded to the survey either through the Web-based survey or via the mail survey. For the remainder of the RMD businesses not responding to the survey, employment data only was obtained through the ESC database, the Selectory, and through phone calls to the businesses. Data could not be found for only six of the 632 North Carolina RMD companies in the initial survey sample. Although this year’s survey used a more labor-intensive process, the response rate for employment data was a very high 99.05 percent as noted in Table 1.

Table 1. Recycling Business Survey Response Rate

		<b>Completed</b>	<b>Sent</b>	<b>Response Rate</b>
<b>RMD Businesses Surveyed</b>	Web-Mail	213		33.70%
<b>RMD Businesses Other</b>	ESC/Harris/Phone	413		65.35%
<b>TOTAL</b>		<b>626</b>	<b>632</b>	<b>99.05%</b>

As previously discussed, additional recycling employment data was included for recycling-related businesses not listed in the RMD. Since the ESC database includes NAICS codes for each business listing, several recycling-related NAICS codes were queried including NAICS code 423930 (Recyclable Material Merchant Wholesalers), NAICS code 321920 (Container and Pallet Manufacturing) and NAICS code 562111 (Waste Haulers).

A general query for “recycling” or “recycle” in the company name field was also conducted. Twenty additional recycled-content manufacturing companies not listed in the RMD were also included in the study. Based on data collected from the RMD business survey and combining data from additional sources (recyclable material merchant wholesalers, pallet manufacturers, waste haulers, companies with “recycling” or “recycle” in the company name and 20 recycled-content manufacturers) it is estimated that there are nearly 15,200 people working in North Carolina in jobs directly related to recycling. See Table 2 for the breakdown of total recycling employment data.

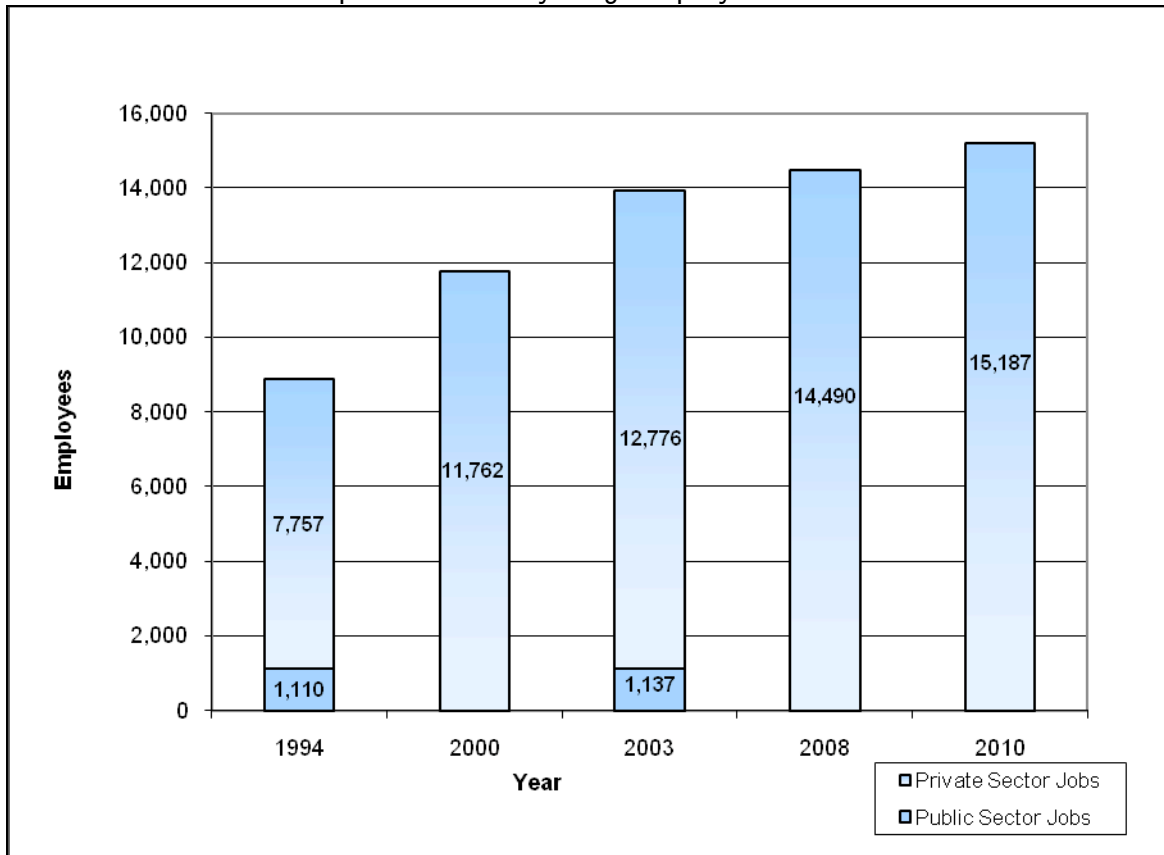
Table 2. 2010 N.C. Recycling Employment

Recycling Business Study Sample	Data Source	FTE-R
RMD Businesses (632)	Web-Mail-Phone	10,515
Recycled Content Manufacturers (20)	ESC, Harris Infosource	2,321
NAICS-562111 (Waste Haulers)	ESC	198
NAICS-321920 (Pallet Manufacturers)	ESC	917
NAICS-423930 (Recyclable Material)	ESC	1,119
"Recycler"/"Recycling" company name title	ESC	116
	TOTAL	15,187

#### Employment Data Comparisons to Prior Studies

The 2010 study was an update to previous studies conducted in 1994, 2000, 2004 and 2008. As Graph 1 indicates, recycling employment continues a positive upward trend. From 2008 to 2010, private sector recycling employment increased 4.8 percent. The 1994 and 2003 analysis included public sector recycling employment, while the 2000, 2008 and 2010 studies did not.

Graph 1: N.C. Recycling Employment Trend



#### Additional Recycling Business Survey Data

In addition to employment data, the businesses responding to the recycling business survey also provided information on hourly wage data, recyclable materials targeted, recycled material products manufactured and anticipated job creation. Survey respondents reported an average hourly wage of \$12.50 or a total North Carolina recycling business payroll of \$395 million—an increase of \$18.2 million from the 2008 study.

In the 2008 study, 45 percent of survey respondents estimated that 339 new recycling-related jobs would be created over the next two years. The 2010 study results show that recycling-related job growth projections were only marginally down from the 2008 estimate. Survey respondents in 2010 stated that 515 new recycling jobs have been created since 2008 and 187 recycling-related jobs have been terminated during the same time frame for a net total of 328 jobs created.

Recycling businesses surveyed anticipate increased employment growth. When asked if the business planned on creating new jobs, 102 businesses or 48 percent estimated that 400 new jobs would be created during the next two years.

Recycling businesses target a wide variety of recyclables for collection, processing or use in manufacturing. No single commodity dominates the recycling sector in North Carolina. Surveyed businesses reported targeting the following common recyclable materials: aluminum cans, PETE plastic, HDPE plastic, other plastic, glass, newspapers, corrugated cardboard, office paper, mixed paper, other paper, magazines, textiles, other metal scrap, electronics, construction and demolition materials and woody and organic materials. In addition, surveyed businesses were given the opportunity to write in other recyclables targeted. Table 3 includes a listing of “other” recyclables.

**Table 3: “Other Recyclables” Collected, Processed or Utilized**

Antifreeze, used oil, oil filters	Petroleum-related compounds
Asphalt shingles	Polypropylene, polystyrene foam, post-industrial plastic, rigid plastic
Bakery waste	Soil
Carpet and foam carpet pad	Steel cans
Ceiling tile	Steel, plastic, fiber drums
Chemical wastes	Styrofoam
Concrete	Textile yarn cones and tubes
Cooking oil and grease	Toner and cartridges
Film	TV cathode ray tubes
Food waste	Used car and truck rubber tires
Gypsum wall board	Vinyl siding
Junk vehicles	Wastewater
Lead acid batteries	Waste wood/wood scrap
Lights containing mercury	White goods and appliances
Mulch	Wood furniture
Non-tire rubber	Wood pallets, crates and spools

The number of products using recycled material manufactured by North Carolina businesses is diverse and numerous. Twenty-five percent of businesses responding to the survey reported manufacturing a product using recycled materials. Table 4 includes a listing of recycled material products North Carolina businesses reported manufacturing.



Table 4: Manufactured Recycled Material Products List

Agri-gypsum	Glass tiles, pavers, countertops, bowls
Aluminum cans	Gypsum powder and gypsum paper
Animal feed ingredients	Horse bedding
Automotive antifreeze/coolant	Industrial fuel
Biodiesel	Molded paper pulp products
Bird houses	Paper
Boiler fuel	Plastic HDPE Pipe
Cat litter	Plastic pellets
Cellulose insulation	Re-refined oil
Concrete aggregate	Soil amendments, mulch, compost
Concrete pavers	Solid rubber tire wheels
Die cut machine products - stickers	Steel plates
Erosion control products	Toilet paper and paper towels
Fuel pellets	Wood flooring, beams, timbers, furniture, paneling, building materials
Glass bottles	Wood pallets and crates
Glass cullet, powder, glass-blasting media	Wood tables, cutting boards, musical instruments

Businesses surveyed were also asked to quantify the tonnage of recyclables collected, processed, brokered and used in manufacturing. However, tonnage data was inconclusive and therefore not reported as a total quantity for the report.

### Conclusion

In summary, the North Carolina recycling economy continues an upward growth trend. In 2010, an estimated 15,200 private sector recycling-related jobs in the state involved the collection, processing, manufacturing, reuse or composting of post-consumer or post-industrial materials. North Carolina recycling businesses are strong, diverse and use a large variety of recyclable or discarded materials that become feedstock for a wide variety of products.