

# **EMPLOYMENT TRENDS IN NORTH CAROLINA'S RECYCLING INDUSTRY – 2013**



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# **Employment Trends in North Carolina's Recycling Industry -- 2013**

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## **EMPLOYMENT TRENDS IN NORTH CAROLINA'S RECYCLING INDUSTRY – 2013**

### **Executive Summary**

This report presents findings from an employment study of recycling businesses in North Carolina in 2013. More than 700 private sector recycling businesses were surveyed and researched for employment data. The major findings include:

- There are currently more than 17,000 direct private sector recycling-related jobs in North Carolina.
- Private sector recycling jobs have increased 11.95 percent since 2010.
- Total estimated annual payroll for North Carolina recycling businesses is \$442 million.
- Forty-five percent of recycling businesses surveyed anticipate creating more jobs during the next two years.
- Eighty-one recycling businesses reported spending \$79.6 million in equipment, facilities and land investments from 2011-13.
- Fifty-one percent of recycling businesses surveyed plan on investing \$47.3 million in equipment, facilities or land in the next two years.
- Twenty-eight percent of businesses surveyed report manufacturing a product using a combined 2,264,565 tons of recycled materials.
- Recycling businesses target a wide variety of recyclables for collection, processing or use in manufacturing. No single commodity dominates the state's recycling economy.

### **Background**

From May 2013 through October 2013, the Recycling Business Assistance Center (RBAC) in the N.C. Division of Environmental Assistance and Customer Service 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, 2008 and 2010.

### **Methodology**

For this study, a recycling business was defined as a company involved in the recovery, reuse or remanufacture of materials. This includes activities such as collection, processing, manufacturing, reuse or composting of post-consumer or post-industrial materials. A recycling-related employee was defined in the study 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 state's Recycling Business Assistance Center, or RBAC, maintains a free, online Recycling Markets Directory, or RMD, 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 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). At the time of this study, there were 720 North Carolina-based recycling businesses listed in the RMD.

Every recycling business or organization in North Carolina listed in the RMD with an email address received the online recycling business survey. The primary data sample included 580 North Carolina-based recycling business operations with email addresses. The remaining 140 RMD businesses without email addresses were placed on a list to obtain employment data by direct contact to the business or through a secondary data source.

***Business Survey Design.*** Survey Monkey™ was the online survey 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, investment projections 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.

***Business Survey Implementation.*** All 580 recycling businesses with email addresses received an email invitation on May 3, 2013 to participate in the online 2013 Recycling Business Employment Study update. Companies that did not respond to the initial web-based survey invitation were sent two additional e-mail notices before the survey was closed on May 31, 2013.

Unresponsive businesses and the 140 RMD businesses without email addresses were placed on a list to obtain data through the secondary data source or to obtain employment by direct phone calls to the businesses. Other survey questions were not addressed during this data collection effort.

***Secondary Data: Recycling Employment.*** The secondary source of jobs data used for this study was the N.C. Employment Security Commission database. This database lists company names, North American Industry Classification System, or NAICS, code classifications, employment and addresses for North Carolina businesses as reported in the fourth quarter of 2012.

Once the overall employment number was obtained for each business, industry experts in RBAC estimated the percentage of recycling-related employees.

***Additional Data.*** While the RMD is a great resource for identifying recycling-related businesses, it does not include all recycling companies in the state. Not every recycling business in the state has chosen to list its business 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 recycled commodities. With access to the ESC database, there was an opportunity to query 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. Employment Securities Commission’s dataset included NAICS codes for each business listing. As there is no general classification number for the recycling industry, the ESC’s database was queried for a variety of classification codes used by various recycling-related sectors. The NAICS codes used in the study include: 423930 (Recyclable Material Merchant Wholesalers), 562920 (Materials Recovery Facilities)<sup>1</sup>, 321920 (Container and Pallet Manufacturing), 562111 (Waste Haulers), and 562212 (Solid Waste Landfill)<sup>1</sup>. 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 codes 562111 (Waste Haulers) and 562212 (Solid Waste Landfill), and 66 percent employment of NAICS code 321920 (Container and Pallet Manufacturing) was dedicated to recycling.

From staff contact and interaction, 45 additional recycled-content manufacturing companies and other recycling businesses 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 in 2005 and 2007. Employment data for these companies was obtained through phone calls and emails to the businesses or 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 2010 employment study, the 2013 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 720 North Carolina businesses listed in the RMD. Of the 720 businesses listed in the RMD, 580 businesses received the online survey. Of the 580 businesses receiving the online survey, 203 businesses, or 28 percent, responded to the survey. For the remaining 517 RMD businesses not responding to the survey or businesses without email addresses, employment data only was obtained through the Employment Security Commission’s database and through direct contact to the businesses. Employment data could not be found for only 12 of the 720 North Carolina RMD businesses. The total response rate for North Carolina RMD businesses employment data was 98.3 percent.

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 the following: 423930 (Recyclable Material Merchant Wholesalers), 562920 (Materials Recovery Facilities), 321920 (Container and Pallet Manufacturing), 562111 (Waste Haulers), and 562212 (Solid Waste Landfill).

A general query in the ESC’s database for “recycling” or “recycle” in the company name field was also made and included in the analysis. Forty-five additional recycled-content manufacturing companies and other recycling businesses 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, more than 17,000

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<sup>1</sup> NAICS codes 562920 and 562212 were included in the 2013 study analysis and not prior studies. The omission in previous studies was an oversight.

people are estimated to be working in North Carolina jobs directly related to recycling. See Table 2 for the breakdown of total recycling employment data.

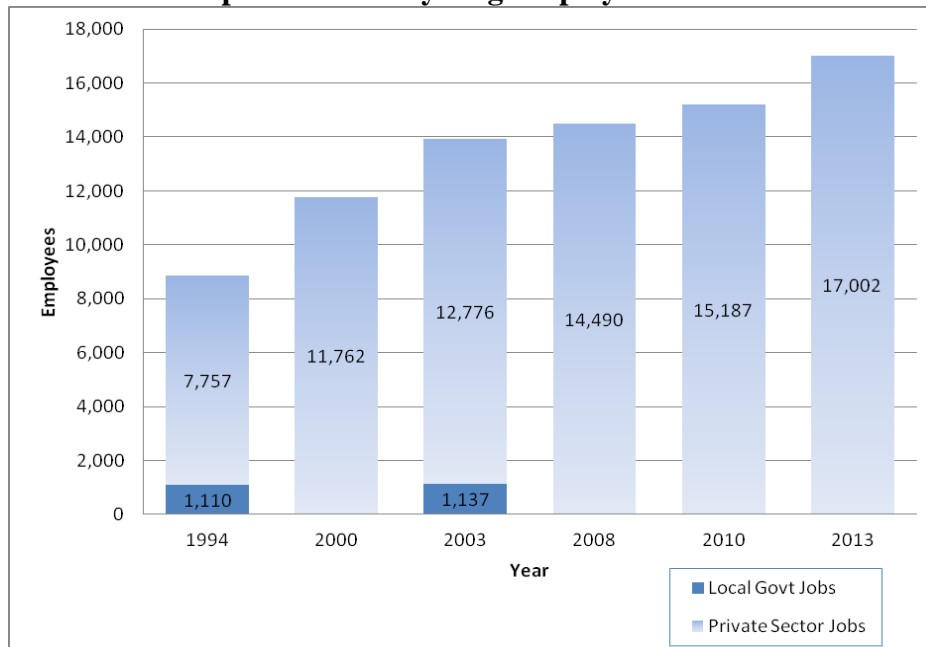
**Table 2: 2013 N.C. Recycling Employment**

Recycling Business Study Sample	Data Source	FTE-Recycling
RMD Businesses (720)	Survey-Phone calls-ESC	12,365
Recycled Content Manufacturers and companies and other recycling businesses not in RMD (45)	Phone calls and ESC	2,581
NAICS-562111/562212 (Waste Haulers/Solid Waste Landfill)	ESC	198
NAICS-321920 (Pallet Manufacturers)	ESC	577
NAICS-423930/562920 (Recyclable Material/Materials Recovery Facilities)	ESC	938
"Recycler"/"Recycling" company name title	ESC	343
	<b>TOTAL</b>	<b>17,002</b>

**Employment Data Comparisons to Prior Studies**

The 2013 study was an update to previous studies conducted in 1994, 2000, 2004, 2008 and 2010. As Graph 1 indicates, recycling employment continues a positive upward trend. From 2010 to 2013, private sector recycling employment increased 11.95 percent. The 1994 and 2003 analyses included public sector recycling employment, while the 2000, 2008, 2010 and 2013 studies did not to make the study more focused on private sector activity.

**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 wages, recyclable materials targeted, tonnages, recycled material

products manufactured, investment and anticipated job creation. Survey respondents reported an average hourly wage of \$12.50 or a total North Carolina recycling business payroll of \$442 million—an increase of \$47.2 million from the 2010 study.

Unlike previous studies, the 2013 survey included an additional question to gauge investment projections in equipment, facilities and land investment in the next two years. Fifty-one percent of businesses responded that they anticipate making additional capital investments and estimate spending \$43.3 million in the next two years.

As a supplement to the investment projection survey question, RBAC staff performed a retroactive analysis of private recycling business capital investment over the 2011-13 study timeframe. Investment data was aggregated through actual data reported to staff through direct contact or from RBAC’s Recycling Business Development Grant program final reports. During the three years analyzed, 81 recycling businesses reported spending \$79.6 million in capital investment.

In the 2010 study, 48 percent of survey respondents estimated that 400 new recycling-related jobs would be created during the next two years. Survey respondents in 2013 stated that 829 new recycling jobs have been created since 2010 and 156 recycling-related jobs have been terminated during the same time frame for a net total of 673 jobs created, or a 68 percent increase from the 2010 projection.

Recycling businesses surveyed for the 2013 study anticipate increased employment growth. When asked if the business planned on creating new jobs, 91 businesses, or 45 percent, estimated that 421 new jobs would be created during the next two years.

Recycling businesses surveyed were also asked to quantify the tonnage of recyclables collected, processed, brokered and used in manufacturing. Sixty-seven percent of businesses responding reported collecting 1,522,171 tons of recyclables. Sixty-six percent of businesses reported processing 2,277,577 tons of recyclables. Twenty-five percent of businesses reported brokering 235,537 tons of recyclables. Twenty-eight percent of businesses reported using 2,264,565 tons of recycled material in the manufacture of products. See Table 3 for a summary of recycling tonnages collected, processed, brokered and used in manufacturing.

**Table 3: Recycling Tonnages Collected, Processed, Brokered and Used in Manufacturing**

<b>Recycling Business Activity</b>	<b>Tons</b>
Recyclables Collected	1,522,171
Recyclables Processed	2,277,577
Recyclables Brokered	235,537
Recyclables Used in Manufactured Products	2,264,565

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, Polyethylene terephthalate, or PET plastic, High-density polyethylene, or 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 option to provide open-ended responses for other

recyclables targeted. Table 4 includes the listing of open-ended responses of “other” recyclables collected, processed or utilized in manufacturing as reported by businesses.

**Table 4: “Other Recyclables” Collected, Processed or Utilized**

Antifreeze	Metal (Non-ferrous and ferrous items)
Asphalt roofing shingles	Mulch
Batteries	Polypropylene, stretch wrap
Carpet and carpet pad	Polyvinyl Chloride (PVC)
Catalytic converters	Printing scrap
Clay	Reclaimed materials for creative reuse
Concrete	Reclaimed wood from old mills, barns and homes
Cooking oil and grease	Recycled rubber and tires
Edible food donations	Salvaged building materials
Electrical Equipment	Styrofoam
Fluorescent bulbs and other mercury containing bulbs	Telecommunications products
Food waste	Used motor oil
Household appliances/furnishings/furniture	Waste wood products for boiler fuel
Latex paint	Wire and cable
Mattresses and boxsprings	Wood pallets

The number of products using recycled material manufactured by North Carolina businesses is diverse and numerous. Twenty-eight percent of businesses responding to the survey reported manufacturing a product using recycled materials. Table 5 includes a listing of recycled material products North Carolina businesses reported manufacturing.

**Table 5: Manufactured Recycled Material Products List**

Asphalt	Reconditioned IBC's
Biodiesel	Reconditioned electrical equipment
Brick chips	Recycled plastic feedstock (pellets, regrind, bales)
Cellulose fibers used in erosions control products and industrial applications	Refurbished computers
Compost and compost tea	Roofing
Concrete aggregate	Solid rubber tire wheels
Crumb rubber	Steel plates
Drain field material made from tires	Structural clay products
EPP foam molding parts	Tire derived fuel
Furnace ready glass cullet	Toner cartridges
Furniture	Topsoil
Furniture, cabinet, lawn and garden parts	Trash carts, lids, parts, and recycle bins.
Glass bottles	Upcycled arts and crafts
Growing media (potting soil)	Wiping cloths (rags)
Mattresses	Wood boiler fuel
Mulch and wood chips	Wood fiber
Paper	Wood flooring, paneling, mantels, wood trim
Planters and frames	Wood pallets



**Conclusion**

In summary, the North Carolina recycling economy continues an upward growth trend. In 2013, an estimated 17,002 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.