

EMPLOYMENT TRENDS IN NORTH CAROLINA'S RECYCLING INDUSTRY - 2020



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Employment Trends in North Carolina's Recycling Industry -- 2020

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Executive Summary

This report presents findings from an employment study of recycling businesses in North Carolina in 2020. More than 600 private sector recycling businesses were surveyed and researched for employment data. Major findings are:

- There are currently more than 15,712 direct private sector recycling-related jobs in North Carolina.
- Private sector recycling jobs have decreased 3.4 percent since 2015.
- Total estimated annual payroll for North Carolina recycling businesses is \$759 million.
- Forty-three percent of recycling businesses surveyed anticipate creating more jobs during the next two years.
- Thirty-seven recycling businesses reported spending a total of \$4.8 million in equipment, facilities and land investments from the 2018-19 fiscal year.
- Fifty-four percent of recycling businesses surveyed plan on investing a total of \$27.2 million in equipment, facilities or land in North Carolina the next two years.
- Twenty-five percent of businesses surveyed report manufacturing a product using a combined 646,188 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.

I. Study Background, Methodology and Design

Background

From March 2020 through September 2020, 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 the 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, 2010, 2013, and 2015.

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 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. While the RMD includes national markets in addition to North Carolina-based markets, only North Carolina companies were surveyed for this study along with the North Carolina-based locations of national companies. At the time of this study, there were 612 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. 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.

In an effort to increase participation for recycling businesses not listed in the RMD, the 2020 study methodology changed slightly to include a survey access weblink on both the RBAC and the Carolina Recycling Association's respective webpages.

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. The survey also included questions about recycling tonnages, recyclable materials, investment projections and hourly wage questions. Recycling businesses with email addresses received an email invitation to participate in the survey. The survey was promoted by RBAC and the Carolina Recycling Association through online newsletter mailing lists.

Business Survey Implementation. All recycling businesses with email addresses received an email invitation in April 2020 to participate in the online study. Companies that did not respond to the initial web-based survey invitation were sent four additional email notices before the survey was closed in mid-July.

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

Secondary Data: Recycling Employment. The secondary source of data used for this study was the N.C. Department of Commerce, Division of Employment Security (DES) database. The DES 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 2019. Additionally, the DES database includes average quarterly wages that were integrated into the analysis, enabling a more robust average recycling business wage to be calculated in the 2020 study.

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 businesses 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 DES database, there was an opportunity to query other recycling companies not listed in the RMD, such as recycled-material dependent manufacturers, and gather additional employment and wage data for the study.

The DES dataset included NAICS codes for each business listing. As there is no general classification number for the recycling industry, the DES database was queried for a number 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), 321920 (Container and Pallet Manufacturing), 562111 (Waste Haulers), and 562212 (Solid Waste Landfill). A general query for “recycling” or “recycle” in the company name field was also performed. Businesses identified were cross-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, 35 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 DES database. To avoid overestimating recycling employment data, RBAC industry experts estimated the percentage of recycling-related employees.

II. Results

Recycling Business Survey Results

Like the last employment study conducted in 2015, the 2020 recycling employment study 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 612 North Carolina businesses listed in the RMD. Of those 612, 571 businesses received the online survey and 79 businesses, or 14 percent, responded to the survey. Two businesses not listed in the RMD responded to the survey via the web link. For the remaining 571 RMD-listed businesses that did not respond to the online survey or businesses without email addresses, employment data was obtained through the DES database and through direct contact to the businesses. Employment data could not be found for only 29 (5 percent) of the 612 North Carolina RMD-listed businesses.

As previously discussed, additional recycling employment data was included for recycling-related businesses not listed in the RMD. Since the DES 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 DES database for “recycling” or “recycle” in the company name field was also made and included in the analysis. Thirty-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 15,712 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.

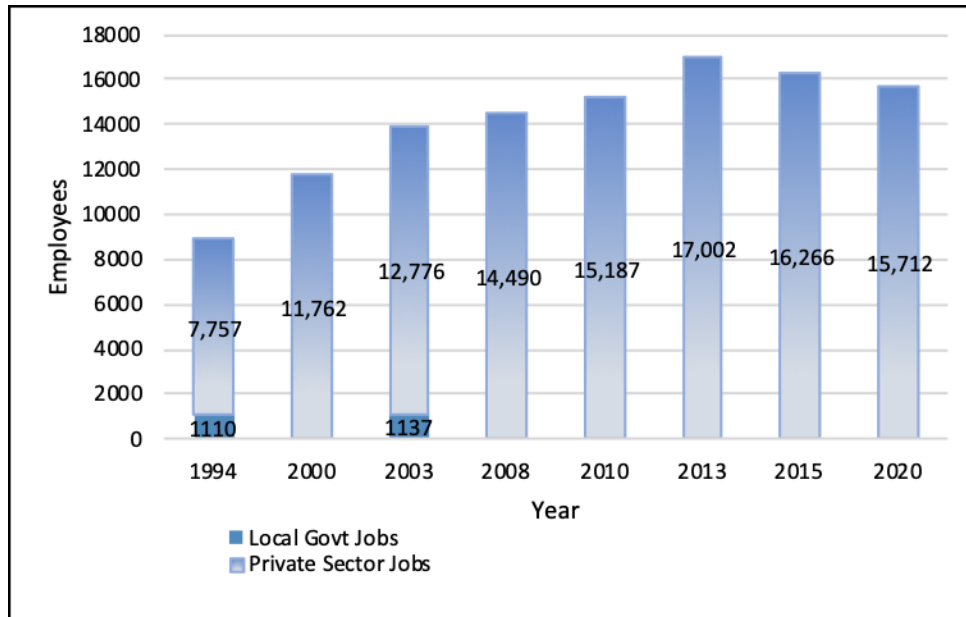
Table 2: 2020 N.C. Recycling Employment

Recycling Business Study Sample	Data Source	FTE-Recycling
RMD Businesses (612)	Survey-Phone calls-DES	11,336
Recycled Content Manufacturers and companies and other recycling businesses not in RMD (35)	Phone calls and DES	2,370
NAICS-562111/562212 (Waste Haulers/Solid Waste Landfill)	DES	274
NAICS-321920 (Pallet Manufacturers)	DES	371
NAICS-423930/562920 (Recyclable Material/Materials Recovery Facilities)	DES	983
"Recycler"/"Recycling" company name title	DES	378
	TOTAL	15,712

Employment Data Comparisons to Prior Studies

The 2020 study was an update to previous studies conducted in 1994, 2000, 2004, 2008, 2010, 2013 and 2015. As the graph below indicates, recycling employment declined slightly in 2020. From 2015 to 2020, private sector recycling employment decreased 3.4 percent. The 1994 and 2003 analyses included public sector recycling employment, while the 2000, 2008, 2010, 2013, 2015 and 2020 studies did not to make the study more focused on private sector activity.

N.C. Recycling Employment Trend



Additional Recycling Business Survey Data

In addition to employment data, the businesses responding to the online survey also provided information on hourly wages, recyclable materials targeted, tonnages, recycled material products manufactured, investment, and anticipated job creation.

Eighty-six percent of survey respondents reported average hourly wage information. Average quarterly wage data was provided for each business in the DES dataset. Missing or incomplete wage survey data was supplemented with DES quarterly wage data. In addition to the wage data gathered through the online survey, RBAC staff searched the DES database for quarterly wage data for all of the businesses included in the study sample.

The total payroll of North Carolina’s recycling businesses was \$759 million. These businesses paid an average hourly wage of \$23.23 which is an 18 percent increase over the 2015 average wage of \$19.64.

North Carolina recycling businesses plan to make additional investments in recycling infrastructure in equipment, facilities and land investment. Fifty-four percent of businesses responded that they anticipate making additional capital investments and estimate spending a combined \$27.2 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 2018-19 fiscal year. Investment data was aggregated from final reports from RBAC’s Recycling Business Development Grant program. During the two years analyzed, 37 recycling businesses reported spending a total of \$4.8 million in private capital investment. The State of North Carolina invested an additional \$1 million in grant funds in these projects, for a total capital investment of \$5.9 million. Each year, these projects returned approximately 8.1 million tons of recyclable material back into the economy and created a total of approximately 38 jobs.

Recycling businesses surveyed anticipate increased employment growth. When asked if the business planned on creating new jobs, 35 businesses, or 43 percent, estimated that 150 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. Fifty-nine percent of responsive businesses reported collecting 1,140,422 tons of recyclables. Seventy-five percent of businesses reported processing 3,119,168 tons of recyclables. Thirty-two percent of businesses reported brokering 1,731,209 tons of recyclables. Twenty-five percent of businesses reported using 646,188 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

Recycling Business Activity	Tons	Percent of Responsive Businesses
Recyclables Collected	1,140,422	59%
Recyclables Processed	3,119,168	75%
Recyclables Brokered	1,731,209	32%
Recyclables Used in Manufactured Products	646,188	25%

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; steel cans; food waste; textiles; metal scrap; electronics; construction and demolition materials; and wood material or wood pallets. 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 used in manufacturing as reported by businesses.

Table 4: Other Recyclables Collected, Processed or Used

Acrylonitrile Butadiene Styrene (ABS) plastics	Oil absorbent pads and rags
Aseptic containers	Oil filters (used)
Antifreeze	Paper/ cardboard
Asphalt	Plastic film (LLDPE/LDPE/HDPE)
Asphalt roofing shingles	Polypropylene
Automotive vehicles and parts	Rebond and carpet n-66, n-6
Brass	Rubber
Cardboard cores and tubes	Polyurethane foam
Chemicals	Rubber tires
Computers	Shredded hard drives from computers
Concrete, brick, asphalt, blast rock	Silicone paper rolls
Copper	Transload rubber wire friction
Cotton	Textiles and nonwoven polyester
Expanded Polystyrene (EPS)	Tires
Gloves, rags, absorbents, wipers, PPE	Waste oil
Mattresses	White goods (appliances)
Nonferrous metal	Yellow grease

The number of products using recycled material manufactured by North Carolina businesses is diverse and numerous. Thirty 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

Aggregates	Mulch
Asphalt	Paper (corrugating medium) for box manufacturing
Castings	Plastic pellets
Composted soil	r-HDPE
Erosion control wattles (socks)	Recycled yarn
Glass cullet, abrasives, fiberglass, reflective beads	Rubber flooring and tiles, underlayment, gym flooring
Growing media-"Potting soil"	Slate and tile roofs
HDPE corrugated drainage pipe	Solid rubber tire wheels and bumpers
Mattresses and foundations	Various fiber and plastic products
Molded paper egg cartons and 4-cup carriers	Wood pallets

III. Conclusion

In 2020, an estimated 15,712 private sector recycling-related jobs in the state are involved in the collection, processing, manufacturing, reuse or composting of post-consumer or post-industrial materials. North Carolina recycling employment declined 3.4 percent compared to results of the 2015 employment study.

The decline in employment growth can be attributed to the impacts of multiple forces, such as aggressive international trade bans and contamination policies on recycling commodities, foreign market disruptions, low recycling commodity prices, and a global pandemic. These factors adversely affect recycling employment growth and are part of a larger economic impact on commodity-oriented business sectors.

Depressed global demand for recycling commodities and low prices are expected to continue for the unforeseeable future. Challenged by the disruption in global recycling commodity markets, national recycling processors are redirecting previously exported commodities to domestic end-markets and manufacturers as well as new capacity for material continues to be developed. Reinforcing that trend, survey participants anticipate adding new jobs and making further investments in recycling infrastructure over the next few years.

Despite the challenges facing the recycling economy, North Carolina recycling businesses remain resilient, diverse and use a large variety of recyclable or discarded materials that become feedstock for a wide array of products. The total recycling employment rate decreased only slightly when compared to the intense challenges of the current commodity market conditions. This small dip of 3.4 percent can be attributed to the resiliency of the state's recycling industry and existing infrastructure.