



# STATE OF THE STATE RECYCLING REPORT FISCAL YEAR 2023 - 2024

NC Department of Environmental Quality  
Division of Environmental Assistance and Customer Service  
Recycling and Materials Management Section

# EXECUTIVE SUMMARY

The State of the State Recycling Report presents data for North Carolina’s recycling, composting, and waste reduction efforts for the 2023-24 fiscal year. NC Department of Environmental Quality’s (DEQ) Division of Environmental Assistance and Customer Service (DEACS) compiled and analyzed annual report data from each city and county to assess tonnages of materials collected, recycling market trends, and various collection styles. DEACS uses this information to promote and incentivize effective recycling and composting strategies. This brief report summarizes the waste reduction chapter within the full [North Carolina Department of Environmental Quality’s Consolidated Solid Waste Report](#), and the topics covered include:

- ◆ [Overall traditional tonnage recovered;](#)
- ◆ [Local government collection methods;](#)
- ◆ [Market and material recovery facility trends;](#)
- ◆ [Food waste recovery and composting;](#)
- ◆ [Electronics and solar panels;](#)
- ◆ [Non-traditional materials — construction and demolition, household hazardous waste, special recyclables; and](#)
- ◆ [Environmental and economic impacts.](#)

**Of the 651 local governments in North Carolina, all 100 counties and 57 percent of municipalities operated or contracted for a recycling program in FY 2023-24.**

**These programs collected:**

**1.65 MILLION TONS**  
of material for recycling or composting

WHICH EQUATES TO

**305 POUNDS**  
recovered per capita.

## LOCAL GOVERNMENT RECOVERY TONNAGES

MATERIAL RECOVERED	FY 2019-20	FY 2020-21	FY 2021-22	FY 2022-23	FY 2023-24
Paper	285,848	311,703	291,418	280,440	266,301
Glass	104,659	91,164	85,865	74,866	65,633
Plastics	39,444	38,185	36,993	34,148	39,754
Metal	87,167	91,515	82,153	80,174	86,269
Organics	817,307	828,155	786,205	866,600	934,425
Specialty Wastes	8,720	9,693	8,839	9,990	8,676
Electronics	11,736	10,624	8,908	8,172	8,175
Construction and Demolition Debris	86,973	90,586	98,165	104,330	102,989
Tires	139,104	118,165	97,899	110,475	137,694
Other	2,118	961	1,078	1,073	1,273
<b>Total</b>	<b>1,583,076</b>	<b>1,590,751</b>	<b>1,497,522</b>	<b>1,570,268</b>	<b>1,651,190</b>
Population	10,508,254	10,587,440	10,556,299	10,705,403	10,842,949
Per Capita Recovery (.lbs)	301	300	284	293	305

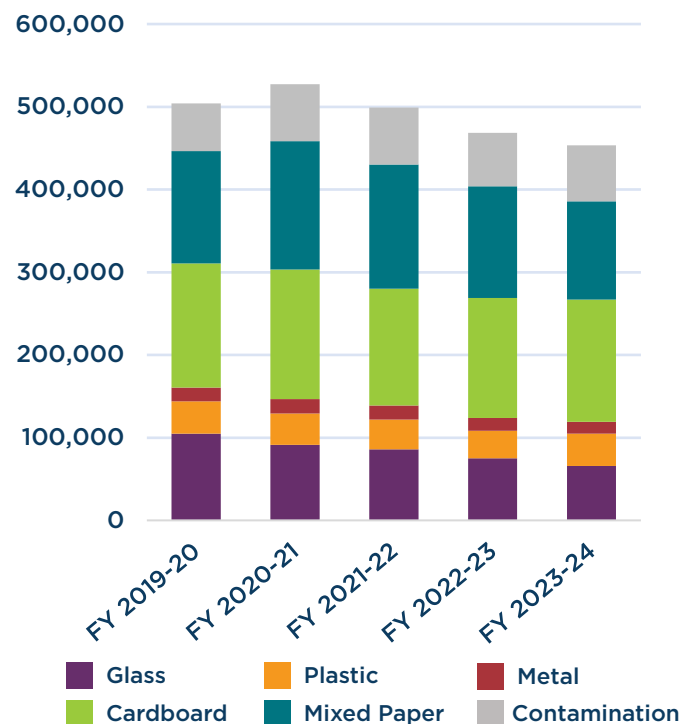
# TRADITIONAL RECYCLING

In FY 2023-24, North Carolina’s local government recycling programs recycled 385,545 tons of traditional household materials (glass bottles and jars, plastic containers, metal cans, paper, cartons, and cardboard), a decrease of 4.6 percent from the previous year. This total does not include the portion of commingled recycling that is assumed to be contamination, or non-recyclable material. In FY 2023-24, MRFs in North Carolina reported an average contamination level of 20.7 percent.

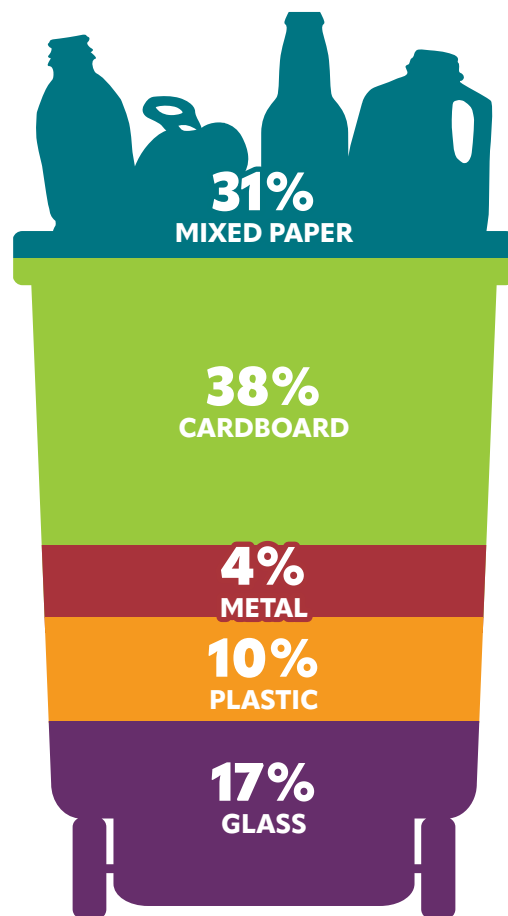
Between FY 2022-23 and FY 2023-24, paper recovery decreased by 5 percent, and container recovery decreased by 4 percent. These declines may be partially due to the expanded practice of “lightweighting,” in which product manufacturers and distributors reduce packaging and use lighter materials to increase energy efficiency in shipping and processing. The decreased weight of materials entering the recycling stream can lead to a decrease in overall tonnage despite similar levels of participation and collection. Furthermore, the collection of glass for recycling

has declined in recent years as some communities have removed glass from the mix of commingled materials accepted in curbside recycling. Another contributing factor is the net loss of six curbside recycling programs during the year. Although affected residents may still have access to drop-off recycling, participation and tonnage is significantly lower without the convenience of curbside collection. This is especially true when garbage is still collected curbside, requiring residents to make an extra effort to bring recyclables to a drop-off point.

## TONNAGES OF TRADITIONAL HOUSEHOLD RECYCLABLES



## PERCENTAGE RECYCLED BY MATERIAL IN FY 2023-24



**385,545 TONS RECYCLED IN TOTAL**

Contamination not included.

# COLLECTION METHODS

Curbside commingled recycling collection provides the most convenient method for residents to recycle and yields the highest amount recycled, compared to other collection methods.

During FY 2023-24, 405 local governments reported residential recycling programs and of those, 297 offered curbside recycling. On average, curbside programs collected 315 pounds of traditional recyclables per household during FY 2023-24, compared to 47 pounds per household collected through drop-off programs. For reference, The Recycling Partnership estimates that the average American household generates a total of 768 pounds of traditional recyclables each year.<sup>1</sup> It is important to note that some drop-off programs, especially those offered by counties, may serve residents who also have curbside collection, resulting in lower drop-off tonnage.

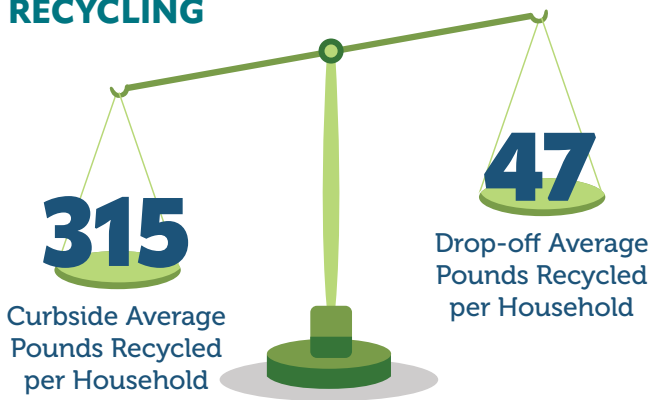


Greensboro recycling truck

Approximately 52 percent of NC households have curbside recycling available through the state’s 297 programs. These curbside programs account for 70 percent of the total traditional recyclable materials collected for recycling by local governments in FY 2023-24. Seventy-eight percent of local governments with curbside programs contract with a private hauler or have a franchise agreement for collection while 22 percent provide the service in-house.

Despite the convenience and popularity of curbside recycling programs, the number of local governments offering curbside recycling collection has decreased in recent years after peaking at 329 programs statewide in FY 2017-18. Challenges related to funding and contamination have steadily brought the number of curbside programs down to 297, though 477 local governments offer curbside solid waste collection. Recycling is an essential part of integrated solid waste management, redirecting materials back into beneficial economic use, conserving limited landfill space, and providing residents the opportunity to comply with state landfill bans on aluminum cans and plastic bottles.

## CURBSIDE VS. DROP-OFF RECYCLING



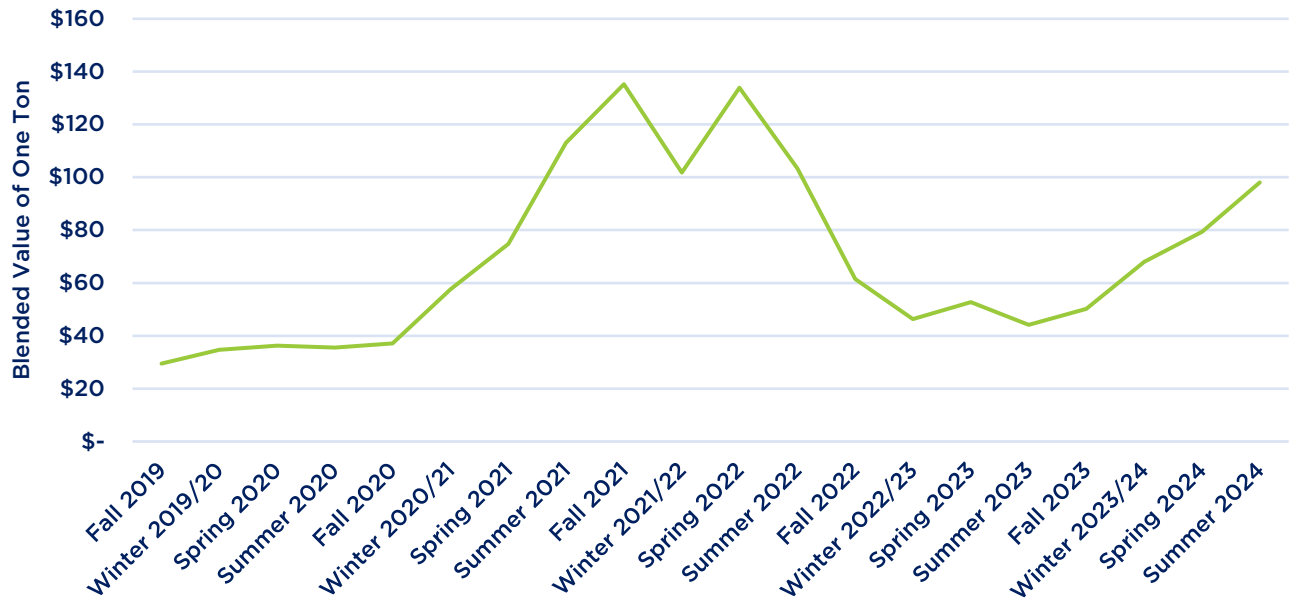
## RECYCLING COLLECTION METHODS

METHOD	COUNTIES	MUNICIPALITIES
Curbside Only	3	239
Drop-off Only	80	28
Curbside and Drop-off	17	38
<b>Total Recycling Programs</b>	<b>100</b>	<b>305</b>
No Recycling Program	0	246

<sup>1</sup> [2020 State of Curbside Recycling](#), The Recycling Partnership.

# MARKETS AND MATERIAL RECOVERY FACILITIES

**BLENDED VALUES OF COMMINGLED RECYCLING TON**



The commodity pricing of material recovery facility (MRF) recyclables is dependent upon a variety of factors including material quality, manufacturer demand, and the comparative cost of virgin raw materials.

When considering the blended material value of a ton of commingled recycling, it is important to consider the makeup of the traditional recycling mix. Glass and contamination make up 36.4 percent of the weight of the commingled mix, both of which have a cost to manage. The most valuable commodities by weight (aluminum and HDPE natural in Summer 2024) make up only 2.9 percent of the weight of the commingled mix. With the blended value averaging \$74 during FY 2023-24, revenue does not cover the cost for MRFs to process the materials, meaning that most haulers or local governments are charged a tipping fee to drop off recyclables.

In addition, contamination continues to be an operational challenge for MRFs. To meet the increasingly strict standards of international markets and expectations of domestic markets,

these facilities have added labor, slowed production lines, and invested in equipment to remove contaminants and produce higher-quality outgoing commodity bales. While the improved quality of recycling is favorable, these adjustments require increased per-ton processing costs which are directly passed on to customers, including local governments. Continued efforts to educate the public and collect cleaner, higher-quality recyclables will improve the economics for everyone.



# FOOD WASTE

Food waste makes up 24 percent of landfill disposal in the U.S., according to the U.S. Environmental Protection Agency (EPA). The diversion of food waste became a major focus area of NC's recycling program during FY 2023-24 through the first round of Food Waste Reduction Grants awarded to four local governments and seven private businesses. The goal of the new grant program is to reduce the amount of food waste disposed in landfills by expanding food donation networks and composting operations.

The projects supported growth of six compost processors like Wilmington Compost Company, a new facility in eastern North Carolina that supports school composting. Five collection projects were funded, including a food scrap collection point in Durham utilizing new technology to facilitate an unmanned drop-off.

**The NCDEQ Food Donation and Compost Resource Map shows locations of food donation organizations and compost opportunities for residents.**



## LOCAL GOVERNMENTS WITH ACTIVE FOOD SCRAP DROP-OFF PROGRAMS IN FY 2023-24:

- Buncombe County
- City of Asheville
- City of Durham
- New Hanover County
- Orange County
- Town of Black Mountain
- Town of Cary
- Town of Davidson
- Wake County

Until the state's organics recycling infrastructure grows to support curbside composting, residential food scrap drop-offs have become popular programs for local governments to implement. North Carolina has 32 food scrap drop-offs at a variety of locations including solid waste facilities, libraries, parks, and farmers markets. Most sites (30) are managed by local governments that contract with private haulers. One drop-off is managed by a business (Crown Town Compost), and one is managed by a non-profit (Cobblestone Farmers Market / Piedmont Environmental Alliance).



City of Durham food waste collection

# ELECTRONICS AND SOLAR PANELS

## ELECTRONICS

North Carolinians have wide access to electronics recycling programs, satisfying public demand for responsible e-waste management options and helping consumers comply with the state disposal ban on computer equipment and televisions. During FY 2023-24, 161 local governments operated electronics recycling programs and collected 8,173 tons of material.

Public electronics recycling has declined since FY 2015-16 when recovery of televisions was nearly 12,000 tons, likely marking the peak of Cathode Ray Tube (CRT) television recycling. North Carolina's decline in electronics tonnage is consistent with national data and reflects the changing material stream of smaller electronics devices and more lightweight models, which is particularly true with televisions.

Local governments that use a recycler with the e-Stewards or R2 certification can apply for Electronics Management Fund distributions from NCDEQ on an annual basis. In FY 2023-24, 54 local governments applied and received a total of \$540,000 in distributions.

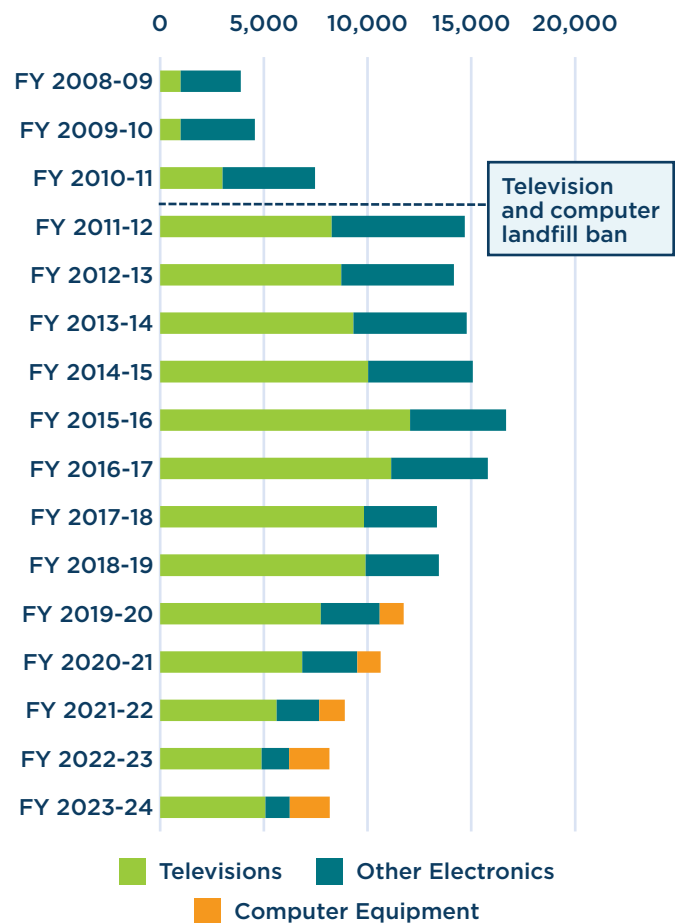
**Average electronics recycling cost:**  
**\$0.32 per capita**

**Average Electronics Management Fund distribution:** **\$0.08 per capita**



Panels stacked for recycling from solarpanelrecycling.com

## COLLECTED ELECTRONICS TONNAGES



## SOLAR PANELS

In 2023, SolarPanelRecycling.com, an affiliate of Powerhouse Recycling, opened the state's first dedicated solar panel recycling line in Salisbury. Specialized machinery allows for 98-100 percent pure recovery of silicon, metals, glass, plastics and aluminum. This investment is the first of its kind on the east coast and a critical piece of infrastructure to manage the state's emerging solar panel waste stream. NCDEQ grant funding in 2023 and 2024 supported the purchase of a collection truck and a second glass removal system to double the line's capacity.

# SPECIAL RECYCLABLES

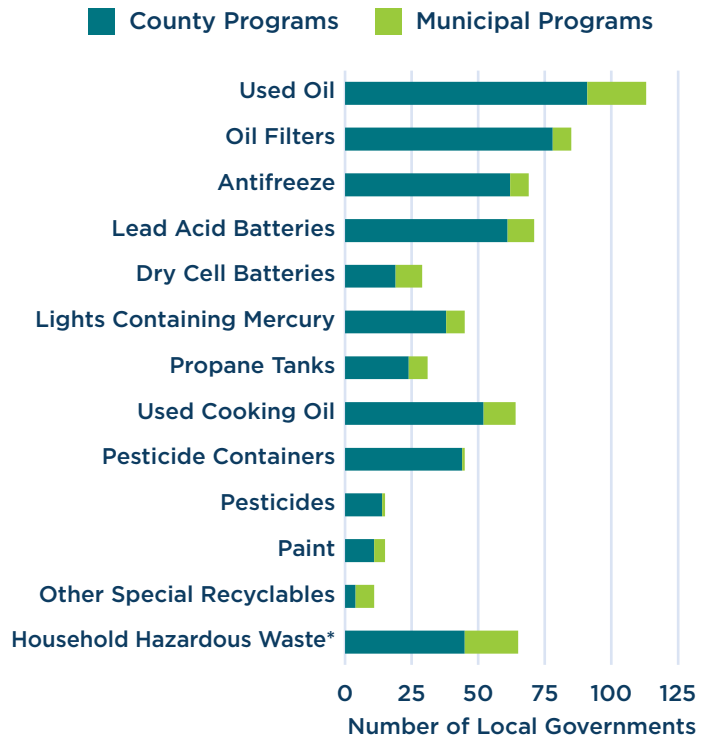
Many local governments in North Carolina offer residents the opportunity to recycle a wide range of additional materials beyond the traditional recyclables, including used motor oil, cooking oil, batteries, household hazardous waste (HHW), and more.

Local governments operate either temporary or permanent HHW events/sites. Temporary HHW programs are designed to collect HHW at a temporary location approved to be used for a single specific date. Permanent HHW programs are for the collection of materials year-round at a facility permitted by the Division of Waste Management.

**In FY 2023-24, there were 34 permanent HHW sites from 27 different local governments (some programs managed multiple sites), and 62 temporary HHW events hosted by 37 different local governments.**

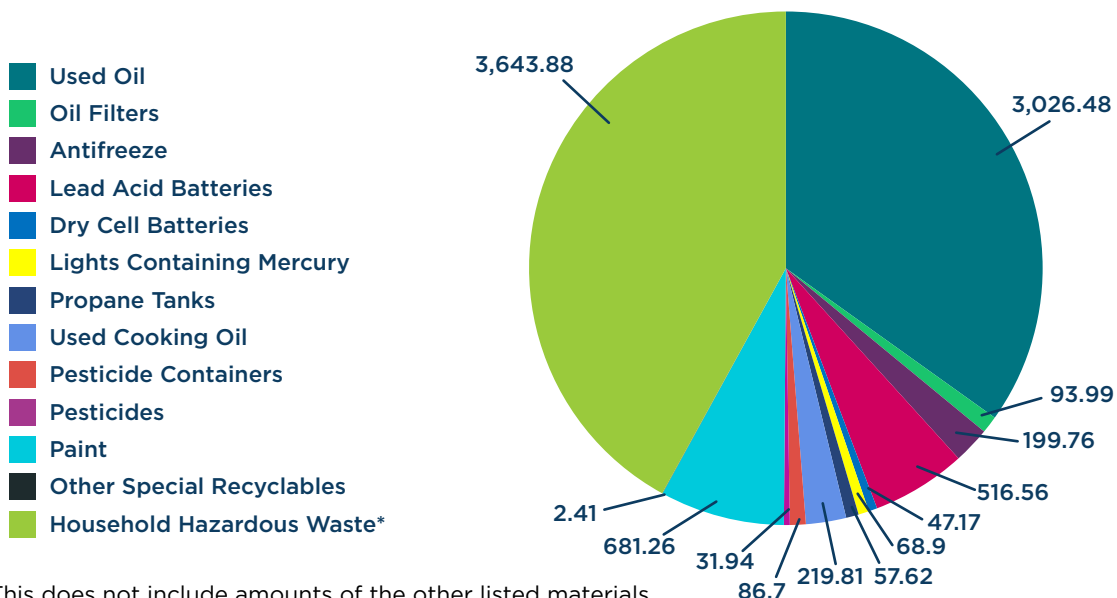
## SPECIAL RECYCLABLES COLLECTIONS

The number of local governments with collection programs for each material type for FY 2023-24.



## SPECIAL RECYCLABLES TONNAGES

Breakdown of the types of special recyclables recovered for FY 2023-24 in tons.



\* This does not include amounts of the other listed materials.



# CONSTRUCTION AND DEMOLITION DEBRIS

Local government recovery of construction and demolition (C&D) debris includes the capture of materials generated by construction and demolition activities. Materials in this waste stream include clean wood, metal, shingles, vinyl siding, drywall (gypsum), carpet, asphalt, and aggregate (brick, block, concrete, and other rubble).

C&D debris recycling decreased by 1.2 percent from FY 2022-23 to FY 2023-24 from 104,330 tons to 102,989 tons.

Of the 1,651,190 tons of material recovered by local governments in FY 2023-24, C&D debris made up 6.2 percent (102,989 tons).

## LOCAL GOVERNMENTS WITH C&D RECYCLING PROGRAMS:

**10** Municipalities with programs + **33** Counties with programs = **43** Total programs

## NUMBER OF LOCAL GOVERNMENTS ACCEPTING TYPE OF MATERIAL

- Clean Wood **17**
- .....
- Asphalt, Brick, or Concrete **28**
- .....
- Drywall **5**
- .....
- Vinyl Siding **3**
- .....
- Shingles **11**
- .....
- Metal **33**
- .....
- Other **7**
- .....



Pitt County's C&D recycling facility.

# WASTE REDUCTION AND RECYCLING IMPACTS

The EPA developed and maintains the Waste Reduction Model (WARM) to help estimate the carbon dioxide equivalent emissions avoided from recycling instead of landfilling discarded materials. In most cases, manufacturing products from recycled material use less energy than manufacturing products from raw materials, which translates to fewer fossil fuels burned and reduced emissions of greenhouse gases that contribute to climate change.

In FY 2023-24, local government recycling of traditional materials (cans, bottles, paper) resulted in greenhouse gas emissions savings of 1,045,8192 metric tons of carbon dioxide equivalent, which is equivalent to removing the annual emissions of 222,042 passenger vehicles.

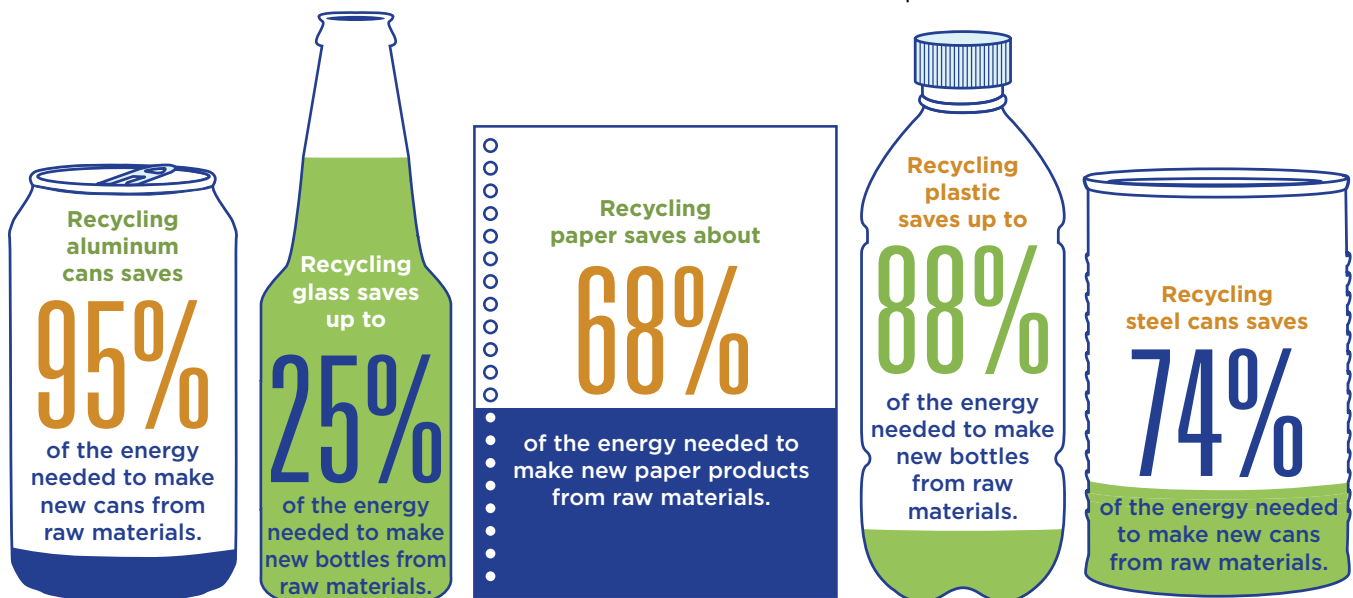
North Carolinians recycled enough paper and cardboard to replace the need to cut down 4,527,117 trees which would make up 30,000 acres of forest land. The state's recycled fiber also reduced the amount of water used in the pulping process by 1.8 billion gallons – roughly 2,700 Olympic-sized swimming pools.

North Carolina has created nearly  
**16,000 PRIVATE SECTOR RECYCLING JOBS**  
with an estimated payroll of  
**\$759 MILLION PER YEAR!**

In addition to the environmental benefits, the state's recycling system provides economic benefits for the state. The industry supports nearly 16,000 private sector jobs which include hauling, material processing, manufacturing, sales, and facility management. The annual payroll associated with the recycling sector exceeds \$700 million.

With the average commingled bale worth \$74 in FY 2023-24, local governments delivered about \$23,520,330 worth of recyclables to MRFs and end markets, most of which are located in the southeast. Recycling is a major driver of economic activity throughout North Carolina and the southeast.

Recycling remains an important facet of the materials management hierarchy and is essential to developing a circular economy that returns useful commodities back into the market rather than landfill disposal.





The North Carolina Division of Environmental Assistance and Customer Service (DEACS) is a non-regulatory division of North Carolina DEQ offering technical and financial assistance to businesses, manufacturers, local governments, institutions, economic developers and the general public in environmental management. For questions, call 1-877-623-6748.