

CONNECTICUT RESIDENTIAL RECYCLING ECONOMIC STUDY

FINAL REPORT

December 2020

RRS <>

Managing change

in a resource-

constrained world.



since 1986



CONNECTICUT RESIDENTIAL RECYCLING ECONOMICS STUDY Recycle PROJECT GOAL

Quantify the Economic Impact of Residential Recycling in Connecticut



WHY DO A RECYCLING ECONOMIC INFORMATION STUDY?

Measurement provides an understanding of the economic contribution of residential recycling in Connecticut

The recycling industry:

- Creates local jobs
- Feeds critical end markets
- Motivates new technology developments
- Contributes to the state's tax revenue and total economic output



METHODOLOGY

RECYCLING ECONOMIC INFORMATION STUDY PROCESS



MATERIALS INCLUDED IN STUDY



Residential Blue Bin

Bottle Deposit

Residentially Focused Stewardship

INDUSTRIES RELATED TO RESIDENTIAL RECYCLING IN CONNECTICUT

Industry Description				
Paper (except newsprint) mills	Nonferrous and aluminum metal foundries and die-casting foundries			
Paperboard mills	Other commercial equipment merchant wholesalers			
All other converted paper product manufacturing	Industrial machinery and equipment merchant wholesalers			
Plastics material and resin manufacturing	Recyclable material merchant wholesalers			
Other pressed and blown glass and glassware manufacturing	Supermarkets and other grocery (except convenience) stores			
Glass product manufacturing made of purchased glass	Environmental consulting services			
Steel product manufacturing and nonferrous metal smelting	Solid waste collections and materials recovery facility*			
Iron foundries and Steel investment foundries	Municipal Recycling Administration			

OUT OF SCOPE ACTIVITIES AND MATERIALS

The following activities, sectors, and associated recycling materials are out of scope and are *not* included in the study:

- Recycling Related:
 - Commercial, institutional, and industrial recycling through MRFs
 - Business to Business Recycling
 - Organics
 - Recovered C&D
 - Scrap Yards
- Reuse Activities:
 - Thrift stores
 - C&D reuse
- Refurbishment/Remanufacturing:
 - Electronics refurbishment

Including additional activities, sectors, and materials would increase the calculated economic contribution of recycling in Connecticut.

PREPARING DATA FOR IMPLAN ECONOMIC MODEL INPUT

Develop list of industries related to residential recycling in CT

> Determine the proportion of each industry that directly involves recycling

> > Determine the proportion of industry's **recycling activities directly** related to residentially sourced materials

FINAL IMPLAN INPUT DATA EXAMPLE

43% of Paperboard mills estimated to directly involve recycling
40% of that 43% is estimated to directly relate to residential material

43% * 40% = 17%of Paperboard mills activity is related to residential recycling

ECONOMIC CONTRIBUTION ANALYSIS PERFORMED WITH IMPLAN

The leading input-output economic model that uses a variety of data sources including Bureau of Labor Statistics, Bureau of Economic Analysis, and the Census Bureau to compile the model's economic datasets.

MAKE AN IMPACT.

MEASURE DIRECT, INDIRECT, AND INDUCED EFFECTS



Direct Effects are the initial effects to a local industry or industries due to the activity or policy being analyzed Indirect Effects are the effects stemming from business to business purchases in the supply chain taking place in the region



Induced Effects are the

effects in the region stemming from household spending of labor income, after removal of taxes, savings, and commuters



STUDY RESULTS

TOTAL ECONOMIC CONTRIBUTION OF RESIDENTIAL RECYCLING IN CONNECTICUT

4,900

\$383M

\$642M

\$1,159M

Direct, Indirect, & Induced Jobs

Total Labor Income Total Value Add Total Economic Output

TOTAL ECONOMIC CONTRIBUTION OF RESIDENTIAL RECYCLING IN CONNECTICUT



COMPONENTS OF RESIDENTIAL RECYCLING ECONOMIC TOTAL OUTPUT



17

PERCENT OF CONNECTICUT'S TOTAL ECONOMIC OUTPUT



TAX CONTRIBUTIONS TO TOTAL ECONOMIC OUTPUT OF THE RESIDENTIAL RECYCLING INDUSTRY IN CONNECTICUT

Impact	Sub County General	Sub County Special Districts	State	Federal	Total
Direct	\$14.0M	\$0.2M	\$17.4M	\$49.1M	\$80.8M
Indirect	\$4.9M	\$0.1M	\$6.3M	\$18.1M	\$29.3M
Induced	\$7.2M	\$0.1M	\$7.5M	\$16.8M	\$31.6M
Total	\$26.1M	\$0.4M	\$31.2M	\$84.0M	\$141.8M

NEXT STEPS - RESEARCH



Factor in the environmental benefits of recycling along with the economic Capture impacts of all recycling activities in Connecticut



Measure Regional Impact of Connecticut's recycling in the Northeast

POTENTIAL TO GROW



Total economic contribution of residential recycling in Connecticut is \$1.16B at current recycling levels



391K tons of mixed residential recyclables are in the trash, recovering them would create jobs and add value to the state's economy

RRS recycle.com

QUESTIONS? KATE MAGUIRE

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APPENDIX: DETAILED METHODOLOGY



KEY INPUT FOR IMPLAN MODEL

Proportion of Employment directly related to residential recycling in Connecticut

CORE DATA SOURCES USED FOR MODEL INPUT

 IMPLAN & U.S.
 Business Census provides total employment numbers by industry sector NAICS 2. Survey effort to determine proportion of Census employment is related to all recycling activity

3. Review of Connecticut recycling data to determine proportion of recycling related to residential recycling activity, excluding commercial

DETAILED METHODOLOGY STEPS TO PREPARE MODEL INPUT

- 1. Literature Review of Previous Recycling Economic Studies
- 2. Identifying relevant activities
- 3. Determining relevant industry sectors
- 4. Translating industry sectors to Connecticut Companies
- 5. Municipal and Private Sector Survey Effort
- 6. Supplemental Research
- 7. IMPLAN model input preparation
 - Proportion of industry directly related to recycling
 - Proportion of industry directly related to residential recycling
- 8. Sensitivity Analysis

STEP 1: LITERATURE REVIEW OF PREVIOUS RECYCLING ECONOMIC STUDIES

Prior to performing the analysis, RRS reviewed the published methodology incorporated by three statewide reports and one regional report to ensure the methodology followed for this study aligned with previous studies. The four reports are:

- ENVIRON International Corporation for the Colorado Department of Public Health and Environment. Economic Study of Recycling in Colorado. November 17, 2014.
- SAIC for the Houston-Galveston Area Council. The Economic Contribution of the Recycling Industry to the Houston-Galveston Region. May 2013.
- Valentine, David, and Ann Ulmer. Missouri Recycling Economic Information Study MOREIS. Prepared by the University of Missouri Institute of Public Policy for the Environmental Improvement and Energy Resources Authority. January 20, 2005.
- The National Recycling Coalition in association with R.W. Beck, Inc. for the Florida Department of Environmental Protection. Florida Recycling Economic Information Study. June 2000.

STEP 2: IDENTIFYING RELEVANT ACTIVITIES AND INDUSTRIES

Activity	Description	Example
Collection	Curbside recycling, bottle redemptions, and materials covered by Connecticut's product stewardship program that residents participate in.	 Municipal or private sector operated curbside recycling collection Mixed recycling drop-off Bottle redemption centers Paint, mattress, and electronics recycling drop-off
Processing	Any facility that performs sorting, cleaning, consolidating, treating, disassembling, or densifying of recyclables.	 Material recovery facilities (MRFs) Bottle deposit primary processing Electronics or mattress dismantling
Reclaiming	Converts material into final product or raw material for first-stage manufacturing.	• Plastic reclaimer that further sorts, washes, and flakes plastic bales from MRFs.
First-Stage Manufacturing	Production of commodities containing material from processed or reclaimed material.	 Production of plastic preforms, sheets, rolls or flake Production of metal billet or ingot Production of paper and paperboard.
Supporting Activities	Research, equipment development and sales, consulting, engineering, brokering, and exchange services.	 Consulting services to support education and outreach or collections MRF equipment development and sales Marketable recycled commodity brokering

Note that the study only included the impacts of residential recycling activities. The impacts of commercial, institutional, and industrial recycling activities were not included.



STEP 2: IDENTIFYING RELEVANT ACTIVITIES AND INDUSTRIES

- First-stage manufacturers using recycling content in their process are included in this study
- Manufacturing stages beyond first-stage manufacturing are not included because once material moves beyond first-stage manufacturing the material competes with virgin material and is often indistinguishable. At this point the loop in recycling is closed.

EXAMPLE SUPPLY CHAIN DIAGRAM: CURBSIDE PLASTIC BOTTLES AND JUGS



STEP 3: DETERMINING RELEVANT INDUSTRY SECTORS

- North American Industry Classification System (NAICS): 2-to-6digit codes that are used by Federal statistical agencies in classifying business establishments for the purpose of collecting, analyzing, and publishing statistical data related to the U.S. business economy.
- IMPLAN economic model data is also based around U.S. Census data and NAICS codes

STEP 3: DETERMINING RELEVANT INDUSTRY SECTORS

Industry Description	NAICS Codes	IMPLAN Model Code
Paper (except newsprint) mills	322121	145
Paperboard mills	322130	146
All other converted paper product manufacturing	322299	151
Plastics material and resin manufacturing	325211	164
Other pressed and blown glass and glassware manufacturing	327212	200
Glass product manufacturing made of purchased glass	327215	202
Steel product manufacturing and nonferrous metal smelting	331110	215
Iron foundries and Steel investment foundries	331511, 331512	227
Nonferrous and aluminum metal foundries and die-casting foundries	331523, 331524, 331529	228
Other commercial equipment merchant wholesalers	423440	393
Industrial machinery and equipment merchant wholesalers	423830	295
Recyclable material merchant wholesalers	423930	296
Supermarkets and other grocery (except convenience) stores	445110	406
Environmental consulting services	541620	463
Solid waste collections and materials recovery facility*	562111, 562920	479
Municipal Recycling Administration	561110	470

STEP 4: TRANSLATING INDUSTRY SECTORS TO CONNECTICUT COMPANIES

- Using the relevant NAICS codes an online search was completed to find as many relevant companies as possible in CT. Searches included:
 - Website identifying contract companies in Connecticut by NAICS code
 - General web search by NAICS code
 - General web search by NAICS industry description
- Once companies were identified, a brief website review was completed to ensure only first stage manufacturing companies within Connecticut were included



STEP 5: PUBLIC AND PRIVATE SECTOR SURVEY EFFORT



STEP 5 SURVEYING EFFORT: WHY CONDUCT SURVEYS?

- Surveys provided total employment and estimated proportion of employment focused on recycling for relevant industries
- This data was a key input in the economic model

STEP 5 SURVEYING EFFORTS: WHO WAS CONTACTED?

• All Connecticut Municipalities & Authorities



• All Material Recovery Facilities and Private Haulers and Stewardship Program Provides

Identified End Markets
STEP 5 SURVEYING EFFORT: MUNICIPAL SURVEY

How solid waste collection services are provided

- Municipal Hauling
- Private Sector Contract or Open Market Hauling

Number of Employees Focused on Direct Recycling Activities

- Collections
- Transfer Station Operations
- Drop-Off Stations

Number of Employees Focused on Recycling Administrative Support

- Recycling education and outreach
- Contract management
- Other recycling administrative staff work



STEP 5 SURVEYING EFFORT: MUNICIPAL SURVEY RESPONSE RATE

77 municipalities responded covering 48% of Connecticut's population

STEP 5 SURVEYING EFFORT: SUMMARY RESULTS OF THE CONNECTICUT MUNICIPAL SURVEY

86%

Have Paid Staff Related to Recycling **49%**

Provide Municipal Recycling Collection Services 493

Estimated Municipal Staff Directly Related to Recycling Collection 209

Estimated Municipal Recycling Related Administration

STEP 5 SURVEYING EFFORT: PRIVATE SECTOR SURVEY

Industry Identification

• Self identifaction of relavent NAICS code

Identification of Recycling Activities

- Collection
- Processing
- Reclaiming
- First-stage manufacturing
- Supporting Activities

Number of Employees Directly Related to Recycling

 What proportion of total employment is focused specifically on recycling activities

STEP 5 SURVEYING EFFORT: PRIVATE SECTOR SURVEY RESPONDENTS

- 4 Material Recovery Facilities
- 2 Large Haulers
- 1 Stewardship Operators
- Very low response rate for Connecticut end markets

STEP 6: SUPPLEMENTAL RESEARCH

- Supplemental research was performed due to gaps in needed data after the surveying effort.
- Supplemental Research Included
 - Literature Review of previous IMPLAN economic studies on recycling -Ex: Houston, Texas, Colorado, Missouri, Florida, Michigan
- Connecticut specific material recovery facility data
- Industry reports Ex: Steel Recycled Content White Paper November 2009
- RRS expert industry knowledge



STEP 7: IMPLAN MODEL INPUT PREPARATION

STEP 7 IMPLAN MODEL INPUT PREPARATION: PROPORTION OF INDUSTRY EMPLOYMENT RELATED TO RECYCLING

Industry Description	Estimated Average Percent of Employment Related to Recycling	Percent Related to Recycling Source
Paper (except newsprint) mills	43%	R.W. Beck Florida Economic Study 2000
Paperboard mills	43%	R.W. Beck Florida Economic Study 2000
All other converted paper product manufacturing	100%	Environ Economic Study of Recycling in Colorado 2014
Plastics material and resin manufacturing	12%	Closed Loop Partners 2019 Report
Other pressed and blown glass and glassware manufacturing	70%	Range Around Environ Economic Study of Recycling in Colorado 2014
Glass product manufacturing made of purchased glass	70%	Range Around Environ Economic Study of Recycling in Colorado 2014
Steel product manufacturing and nonferrous metal smelting	55%	Steel Recycled Content White Paper November 2009
Iron foundries and Steel investment foundries	68%	Range Around Environ Economic Study of Recycling in Colorado 2014
Nonferrous and aluminum metal foundries and die-casting foundries	68%	Range Around Environ Economic Study of Recycling in Colorado 2014
Other commercial equipment merchant wholesalers	21%	Tomra Bottle Deposit Study
Industrial machinery and equipment merchant wholesalers	0.1%	RRS Industry Knowledge
Recyclable material merchant wholesalers	100%	Environ Economic Study of Recycling in Colorado 2014
Supermarkets and other grocery (except convenience) stores	1%	Tomra Bottle Deposit Study
Environmental consulting services	1%	RRS Industry Knowledge
Solid waste collections and materials recovery facility*	56%	RecycleCT Municipal and Business Survey
Municipal Recycling Administration	100%	RecycleCT Municipal and Business Survey

IMPLAN combines solid waste collection services and MRFs into one code. Taken separately, 44% of solid waste collection activity is estimate to be recycling collection related based on both public and

private sector survey responses in Connecticut, and 100% of MRF activity is considered recycling related based on known industry activity. The average above is the weighted average based on employment

STEP 7 IMPLAN MODEL INPUT PREPARATION: PROPORTION OF INDUSTRY EMPLOYMENT RELATED TO RESIDENTIAL RECYCLING

Residentially Focused Proportion	Industries	Data Source
40%	 Paper (except newsprint) mills Paperboard mills All other converted paper product manufacturing Plastic material and resin manufacturing Industrial machinery and equipment merchant wholesalers Recyclable material merchant wholesalers Environmental consulting services Material recovery facilities 	 CT MRF tonnage data breakdown of residential versus commercial incoming stream
60%	 Other pressed and blown glass and glassware manufacturing Glass product manufacturing made of purchased glass 	• CT MRF tonnage data source sited above plus additional residential recycling through bottle deposit program
20%	 Steel product manufacturing and nonferrous metal smelting Iron foundries and steel investment foundries Nonferrous and aluminum metal foundries and die-casting foundries 	 CT MRF tonnage data source sited above minus industrial focus on scrap metal recycling
100%	 Other commercial equipment merchant wholesalers (TOMRA) Bottle deposit returns at supermarkets and grocery Municipal recycling administration 	 Industry input entirely focused on CT Bottle Deposit
60%	 Solid waste collections and Materials recovery facility (combined in IMPLAN) 	Survey response data



STEP 8: SENSITIVITY ANALYSIS



STEP 8 SENSITIVITY ANALYSIS: WHY THIS STEP?

When the supplemental research found more than one recycling employment proportion data point for an industry, the sensitivity analysis allowed RRS to understand the impact different values had on the IMPLAN economic analysis output

STEP 7 IMPLAN MODEL INPUT PREPARATION: PROPORTION OF INDUSTRY EMPLOYMENT RELATED TO RECYCLING

Industry Description	Estimated Average Percent of Employment Related to Recycling Industry in Connecticut	Why the Range
Paper (except newsprint) mills	31 to 57%	U.S. Census provides an employment range for sector
Paperboard mills	43%	R.W. Beck Florida Economic Study 2000
All other converted paper product manufacturing	100%	Environ Economic Study of Recycling in Colorado 2014
Plastics material and resin manufacturing	8 - 12%	Closed Loop Partners 2019 Report and MO 2005 Report
Other pressed and blown glass and glassware manufacturing	45% - 95%	Range Around Environ Economic Study of Recycling in Colorado 2014 and RRS Industry Knowledge
Glass product manufacturing made of purchased glass	45% - 95%	Range Around Environ Economic Study of Recycling in Colorado 2014 and RRS Industry Knowledge
Steel product manufacturing and nonferrous metal smelting	30% - 80%	Range Around Colorado 2014 and Steel Recycled Content White Paper November 2009
Iron foundries and Steel investment foundries	45% - 90%	Range Around Environ Economic Study of Recycling in Colorado 2014 and RRS Industry Knowledge
Nonferrous and aluminum metal foundries and die-casting foundries	45% - 90%	Range Around Environ Economic Study of Recycling in Colorado 2014 and RRS Industry Knowledge
Other commercial equipment merchant wholesalers	21%	Tomra Bottle Deposit Study
Industrial machinery and equipment merchant wholesalers	0.1%	RRS Industry Knowledge
Recyclable material merchant wholesalers	100%	Environ Economic Study of Recycling in Colorado 2014
Supermarkets and other grocery (except convenience) stores	1%	Tomra Bottle Deposit Study
Environmental consulting services	1%	RRS Industry Knowledge
Solid waste collections and materials recovery facility*	56%	RecycleCT Municipal and Business Survey
Municipal Recycling Administration	100%	RecycleCT Municipal and Business Survey

IMPLAN combines solid waste collection services and MRFs into one code. Taken separately, 44% of solid waste collection activity is estimate to be recycling collection related based on both public and

private sector survey responses in Connecticut, and 100% of MRF activity is considered recycling related based on known industry activity. The average above is the weighted average based on employment 2020 totals.

STEP 7 IMPLAN MODEL INPUT PREPARATION: PROPORTION OF INDUSTRY EMPLOYMENT RELATED TO RESIDENTIAL RECYCLING

Residentially Focused Proportion	Industries	Data Source
35-45%	 Paper (except newsprint) mills Paperboard mills All other converted paper product manufacturing Plastic material and resin manufacturing Industrial machinery and equipment merchant wholesalers Recyclable material merchant wholesalers Environmental consulting services Material recovery facilities 	 CT MRF tonnage data breakdown of residential versus commercial incoming stream
55-65%	 Other pressed and blown glass and glassware manufacturing Glass product manufacturing made of purchased glass 	 CT MRF tonnage data source sited above plus additional residential recycling through bottle deposit program
15-25%	 Steel product manufacturing and nonferrous metal smelting Iron foundries and steel investment foundries Nonferrous and aluminum metal foundries and die-casting foundries 	 CT MRF tonnage data source sited above minus industrial focus on scrap metal recycling
100%	 Other commercial equipment merchant wholesalers (TOMRA) Bottle deposit returns at supermarkets and grocery Municipal recycling administration 	 Industry input entirely focused on CT Bottle Deposit
55-65%	 Solid waste collections and Materials recovery facility (combined in IMPLAN) 	Survey response data

POTENTIAL RANGE IN ECONOMIC RESULTS

	Employment	Labor Income	Value Added	Output
Direct	2,200 to 3,000	\$186 – 258M	\$320 – \$436M	\$589 – \$864
Indirect	900 to 1,300	\$70 – \$100M	\$106 – \$152M	\$180 - \$260
Induced	1,000 to 1,400	\$63 – \$88M	\$113 – \$1 <i>57</i> M	\$177 – \$247
Total	4,100 to 5,600	\$320 - \$446M	\$538 - \$745M	\$947 - \$1,371

All previous results tables have provided the average of the high and low range presented here

TOTAL CONNECTICUT ECONOMIC OUTPUT RANGE FOR RESIDENTIAL RECYCLING





APPENDIX: DETAILED ECONOMIC RESULTS BY SECTOR

TOTAL ECONOMIC RESULTS BY INDUSTRY SECTOR

	Total Employment	Total Labor Income	Total Value Add	Total Output
Paper (except newsprint) mills	377.5	\$32,111,000	\$48,290,000	\$144,459,000
Paperboard mills	92.4	\$7,638,000	\$11,367,000	\$33,863,000
All other converted paper product manufacturing	76.2	\$6,289,000	\$8,499,000	\$20,731,000
Plastics material and resin manufacturing	97.9	\$16,318,000	\$22,063,000	\$53,285,000
Other pressed and blown glass and glassware manufacturing	22.6	\$1,270,000	\$1,869,000	\$4,668,000
Glass product manufacturing made of purchased glass	100.4	\$6,719,000	\$9,993,000	\$22,546,000
Steel product manufacturing and nonferrous metal smelting	40.6	\$3,083,000	\$4,498,000	\$12,280,000
Iron foundries and Steel investment foundries	137.1	\$10,606,000	\$14,683,000	\$32,612,000
Nonferrous and aluminum metal foundries and die-casting foundries	50.7	\$3,550,000	\$4,727,000	\$10,628,000
Other commercial equipment merchant wholesalers	404.7	\$38,387,000	\$75,678,000	\$115,339,000
Industrial machinery and equipment merchant wholesalers	2.9	\$244,000	\$492,000	\$749,000
Recyclable material merchant wholesalers	871.3	\$68,134,000	\$127,582,000	\$207,956,000
Supermarkets and other grocery (except convenience) stores	434.7	\$19,690,000	\$29,012,000	\$47,109,000
Environmental consulting services	7.0	\$596,000	\$665,000	\$983,000
Solid waste collections and materials recovery facility*	1,803.1	\$137,020,000	\$255,423,000	\$407,472,000
Municipal Recycling Administration	351.3	\$31,422,000	\$26,988,000	\$44,451,000
TOTAL	4,870	\$383,077,000	\$641,829,000	\$1,159,131,000

EMPLOYMENT

	Direct	Indirect	Induced	Total
Paper (except newsprint) mills	126.6	149.0	101.9	377.5
Paperboard mills	25.7	42.2	24.5	92.4
All other converted paper product manufacturing	39.1	17.2	19.9	76.2
Plastics material and resin manufacturing	22.0	24.2	51.7	97.9
Other pressed and blown glass and glassware manufacturing	12.9	5.6	4.0	22.6
Glass product manufacturing made of purchased glass	62.0	17.0	21.4	100.4
Steel product manufacturing and nonferrous metal smelting	21.3	9.3	10.0	40.6
Iron foundries and Steel investment foundries	78.2	24.5	34.4	137.1
Nonferrous and aluminum metal foundries and die-casting foundries	29.7	9.9	11.1	50.7
Other commercial equipment merchant wholesalers	157.6	125.6	121.4	404.7
Industrial machinery and equipment merchant wholesalers	1.3	0.8	0.8	2.9
Recyclable material merchant wholesalers	400.0	255.8	215.5	871.3
Supermarkets and other grocery (except convenience) stores	318.3	53.9	62.5	434.7
Environmental consulting services	4.4	0.8	1.9	7.0
Solid waste collections and materials recovery facility*	1064.4	305.4	433.2	1803.1
Municipal Recycling Administration	208.3	44.6	98.3	351.3
TOTAL	2,572	1,086	1,213	4,870

LABOR INCOME

	Direct	Indirect	Induced	Total
Paper (except newsprint) mills	\$13,440,000	\$12,324,000	\$6,347,000	\$32,111,000
Paperboard mills	\$2,860,000	\$3,251,000	\$1,527,000	\$7,638,000
All other converted paper product manufacturing	\$3,351,000	\$1,699,000	\$1,239,000	\$6,289,000
Plastics material and resin manufacturing	\$10,826,000	\$2,269,000	\$3,223,000	\$16,318,000
Other pressed and blown glass and glassware manufacturing	\$541,000	\$477,000	\$252,000	\$1,270,000
Glass product manufacturing made of purchased glass	\$3,973,000	\$1,414,000	\$1,332,000	\$6,719,000
Steel product manufacturing and nonferrous metal smelting	\$1,667,000	\$791,000	\$625,000	\$3,083,000
Iron foundries and Steel investment foundries	\$6,467,000	\$1,997,000	\$2,142,000	\$10,606,000
Nonferrous and aluminum metal foundries and die-casting foundries	\$2,077,000	\$780,000	\$693,000	\$3,550,000
Other commercial equipment merchant wholesalers	\$20,776,000	\$10,046,000	\$7,565,000	\$38,387,000
Industrial machinery and equipment merchant wholesalers	\$134,000	\$62,000	\$48,000	\$244,000
Recyclable material merchant wholesalers	\$35,491,000	\$19,216,000	\$13,427,000	\$68,134,000
Supermarkets and other grocery (except convenience) stores	\$12,462,000	\$3,331,000	\$3,897,000	\$19,690,000
Environmental consulting services	\$420,000	\$59,000	\$117,000	\$596,000
Solid waste collections and materials recovery facility*	\$85,824,000	\$24,209,000	\$26,987,000	\$137,020,000
Municipal Recycling Administration	\$21,842,000	\$3,454,000	\$6,126,000	\$31,422,000
TOTAL	\$222,151,000	\$85,379,000	\$75,547,000	\$383,077,000

VALUE ADD

	Direct	Indirect	Induced	Total
Paper (except newsprint) mills	\$18,361,000	\$18,588,000	\$11,341,000	\$48,290,000
Paperboard mills	\$3,877,000	\$4,762,000	\$2,728,000	\$11,367,000
All other converted paper product manufacturing	\$3,862,000	\$2,421,000	\$2,216,000	\$8,499,000
Plastics material and resin manufacturing	\$12,410,000	\$3,934,000	\$5,719,000	\$22,063,000
Other pressed and blown glass and glassware manufacturing	\$682,000	\$738,000	\$449,000	\$1,869,000
Glass product manufacturing made of purchased glass	\$5,431,000	\$2,182,000	\$2,380,000	\$9,993,000
Steel product manufacturing and nonferrous metal smelting	\$2,223,000	\$1,158,000	\$1,117,000	\$4,498,000
Iron foundries and Steel investment foundries	\$7,971,000	\$2,879,000	\$3,833,000	\$14,683,000
Nonferrous and aluminum metal foundries and die-casting foundries	\$2,379,000	\$1,109,000	\$1,239,000	\$4,727,000
Other commercial equipment merchant wholesalers	\$47,380,000	\$14,777,000	\$13,521,000	\$75,678,000
Industrial machinery and equipment merchant wholesalers	\$31 <i>5</i> ,000	\$91,000	\$86,000	\$492,000
Recyclable material merchant wholesalers	\$74,463,000	\$29,123,000	\$23,996,000	\$127,582,000
Supermarkets and other grocery (except convenience) stores	\$16,336,000	\$5,719,000	\$6,957,000	\$29,012,000
Environmental consulting services	\$373,000	\$84,000	\$208,000	\$665,000
Solid waste collections and materials recovery facility*	\$170,906,000	\$36,289,000	\$48,228,000	\$255,423,000
Municipal Recycling Administration	\$11,073,000	\$4,977,000	\$10,938,000	\$26,988,000
TOTAL	\$378,042,000	\$128,831,000	\$134,956,000	\$641,829,000

OUTPUT

	Direct	Indirect	Induced	Total
Paper (except newsprint) mills	\$92,354,000	\$34,271,000	\$17,834,000	\$144,459,000
Paperboard mills	\$20,808,000	\$8,764,000	\$4,291,000	\$33,863,000
All other converted paper product manufacturing	\$13,023,000	\$4,223,000	\$3,485,000	\$20,731,000
Plastics material and resin manufacturing	\$37,735,000	\$6,552,000	\$8,998,000	\$53,285,000
Other pressed and blown glass and glassware manufacturing	\$2,564,000	\$1,397,000	\$707,000	\$4,668,000
Glass product manufacturing made of purchased glass	\$15,052,000	\$3,751,000	\$3,743,000	\$22,546,000
Steel product manufacturing and nonferrous metal smelting	\$8,365,000	\$2,159,000	\$1,756,000	\$12,280,000
Iron foundries and Steel investment foundries	\$21,079,000	\$5,505,000	\$6,028,000	\$32,612,000
Nonferrous and aluminum metal foundries and die-casting foundries	\$6,764,000	\$1,915,000	\$1,949,000	\$10,628,000
Other commercial equipment merchant wholesalers	\$69,779,000	\$24,298,000	\$21,262,000	\$115,339,000
Industrial machinery and equipment merchant wholesalers	\$463,000	\$151,000	\$135,000	\$749,000
Recyclable material merchant wholesalers	\$121,260,000	\$48,962,000	\$37,734,000	\$207,956,000
Supermarkets and other grocery (except convenience) stores	\$25,644,000	\$10,524,000	\$10,941,000	\$47,109,000
Environmental consulting services	\$522,000	\$134,000	\$327,000	\$983,000
Solid waste collections and materials recovery facility*	\$272,302,000	\$59,330,000	\$75,840,000	\$407,472,000
Municipal Recycling Administration	\$19,218,000	\$8,032,000	\$17,201,000	\$44,451,000
TOTAL	\$726,932,000	\$219,968,000	\$212,231,000	\$1,159,131,000

COMPARISON TO PAST STUDIES

In Comparison to CERC, the 2020 RRS Study Found:



In 2012, CERC published "The Economic Impact on Connecticut from Recycling Activity" for CT RRA. The results of the 2020 study were compared to those from 2012. Both studies relied on IMPLAN for their economic modeling. The materials / sectors included in the 2012 research were not published. Thus, the two studies may not be measuring the same activities, making accurate comparison challenging. For example, the 2020 RRS study included deposit material and the stewardship programs, it is unknown if these materials and their associated economic activity were included in 2012.

PERCENT OF CONNECTICUT'S GROSS STATE PRODUCT (GSP)



CT GSP \$246.8B in FY 2019

Residential Recycling Alone \$642M

"2021 Midterm Economic Report of the Governor", February 5, 2020. Office of Policy and Management.

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APPENDIX: MUNICIPAL SURVEY QUESTIONS AND RESULTS

Does your community/authority have any paid staff directly involved with managing, collecting, contracting, or otherwise overseeing your recycling programs							
Community Size:	5,000 & Under	5,001 to 25,000	25,001 to 100,000	100,001 & Up	Total	Percent	
Yes	11	41	11	3	66	86%	
No	5	3	3	0	11	14%	
Total	16	44	14	3	77	100%	

Does your	Does your community/authority staff directly provide solid waste hauling, collection, transfer, or drop-off services?					
Yes – Our staff provides solid waste services to residents.	2	19	3	2	26	39%
No- We have a contracted hauler, open market hauling system, or other hauling services.	9	22	8	1	40	61%
Total	11	41	11	3	66	100%

About how many total staff do you have directly providing solid waste services (drivers, equipment operators, field supervisors, transfer station staff, and/or drop-off staff for all services)?

Community Size:	5,000 & Under	5,001 to 25,000	25,001 to 100,000	100,001 & Up
Total Staff	2.25	5.6	9.75	60

About what portion of your total solid waste service staff listed above are directly providing curbside or drop- off collection or transfer of recycling?						
Community Size:	5,000 & Under	5,001 to 25,000	25,001 to 100,000	100,001 & Up		
Percents	99	61	62	75		

About how many total administrative staff do you have working on your recycling program planning, outreach, and management?						
Community Size:	5,000 & Under	5,001 to 25,000	25,001 to 100,000	100,001 & Up		
Total Staff	1.0	1.1	1.4	3.3		



APPENDIX: PRIVATE SECTOR SURVEY QUESTIONS

PRIVATE SECTOR SURVEY QUESTIONS

Survey Question	Question Structure
Use the dropdown menu to select the NAICS and NAICS description most applicable to your firm or organization in Connecticut. NAICS stands for North America Industry Classification System.	Drop-down list of NAICS codes
Does your firm or organization collect, process, reclaim, first-stage manufacture, or provide supporting activities for recycled material on a regular basis in Connecticut?	Yes or No
How would you best describe the recycling activities of your firm or business in Connecticut? (Please select all that apply)	Multiple Choice: Collection of recyclables, Processing of recyclables, Reclaiming recyclables, Manufacturing "first- stage" products from recycled material, Supporting activities, Other (fill in)
To the best of your knowledge where is the recycled material your firm or organization processes or uses sourced from?	Multiple Choice: Residential, Commercial, Mixture of Residential and Commercial
If you selected "Mixture of residential and commercial or industrial" above, please provide an estimated breakdown of the mixture as percent. For example 50% residential and 50% commercial or industrial.	Fill In
What percent of your employees' time at your firm or organization is dedicated to collection, processing, reclamation, first-stage manufacturing, or providing supporting activities for recycling in Connecticut? The percent need not add up to 100% unless the entire business is dedicated to recycling. For example, if a manufacturer's feedstock is half virgin and half recycled material, then 50% of the manufacturing process involves recycling.	Fill In
What is the average number of employees employed at your firm or organization annually in Connecticut? Average annual number of employees refers to full time or part time employment. For part time workers, enter employment as a fraction of full time employment. For example, a part time employee working 20 hours a week would be 0.5 employment.	Multiple Choice: 0-9, 10-99, 100-199, 200-299, 300- 399, or other (fill in)



APPENDIX: TAX DETAIL ANALYSIS

TAX: SUB COUNTY GENERAL

	Direct	Indirect	Induced	Total
Paper (except newsprint) mills	\$996,000	\$922,000	\$605,000	\$2,523,000
Paperboard mills	\$239,000	\$232,000	\$146,000	\$617,000
All other converted paper product manufacturing	\$138,000	\$82,000	\$118,000	\$338,000
Plastics material and resin manufacturing	\$698,000	\$248,000	\$302,000	\$1,248,000
Other pressed and blown glass and glassware manufacturing	\$33,000	\$31,000	\$24,000	\$88,000
Glass product manufacturing made of purchased glass	\$177,000	\$105,000	\$127,000	\$409,000
Steel product manufacturing and nonferrous metal smelting	\$102,000	\$51,000	\$60,000	\$213,000
Iron foundries and Steel investment foundries	\$277,000	\$105,000	\$205,000	\$587,000
Nonferrous and aluminum metal foundries and die-casting foundries	\$74,000	\$37,000	\$66,000	\$177,000
Other commercial equipment merchant wholesalers	\$1,629,000	\$389,000	\$722,000	\$2,740,000
Industrial machinery and equipment merchant wholesalers	\$13,000	\$3,000	\$5,000	\$21,000
Recyclable material merchant wholesalers	\$3,526,000	\$924,000	\$1,281,000	\$5,731,000
Supermarkets and other grocery (except convenience) stores	\$1,457,000	\$252,000	\$371,000	\$2,080,000
Environmental consulting services	\$3,000	\$2,000	\$11,000	\$16,000
Solid waste collections and materials recovery facility*	\$4,638,000	\$1,376,000	\$2,575,000	\$8,589,000
Municipal Recycling Administration	\$48,000	\$133,000	\$583,000	\$764,000
TOTAL	\$14,048,000	\$4,892,000	\$7,201,000	\$26,141,000

TAX: SUB COUNTY SPECIAL

	Direct	Indirect	Induced	Total
Paper (except newsprint) mills	\$16,000	\$15,000	\$10,000	\$41,000
Paperboard mills	\$4,000	\$4,000	\$2,000	\$10,000
All other converted paper product manufacturing	\$2,000	\$1,000	\$2,000	\$5,000
Plastics material and resin manufacturing	\$11,000	\$4,000	\$5,000	\$20,000
Other pressed and blown glass and glassware manufacturing	\$1,000	\$1,000	\$O	\$2,000
Glass product manufacturing made of purchased glass	\$3,000	\$2,000	\$2,000	\$7,000
Steel product manufacturing and nonferrous metal smelting	\$2,000	\$1,000	\$1,000	\$4,000
Iron foundries and Steel investment foundries	\$5,000	\$2,000	\$3,000	\$10,000
Nonferrous and aluminum metal foundries and die-casting foundries	\$1,000	\$1,000	\$1,000	\$3,000
Other commercial equipment merchant wholesalers	\$27,000	\$6,000	\$12,000	\$45,000
Industrial machinery and equipment merchant wholesalers	\$O	\$0	\$O	\$0
Recyclable material merchant wholesalers	\$58,000	\$15,000	\$21,000	\$94,000
Supermarkets and other grocery (except convenience) stores	\$24,000	\$4,000	\$6,000	\$34,000
Environmental consulting services	\$0	\$0	\$O	\$O
Solid waste collections and materials recovery facility*	\$76,000	\$23,000	\$42,000	\$141,000
Municipal Recycling Administration	\$1,000	\$2,000	\$10,000	\$13,000
TOTAL	\$231,000	\$81,000	\$117,000	\$429,000

TAX: STATE

	Direct	Indirect	Induced	Total
Paper (except newsprint) mills	\$1,087,000	\$1,039,000	\$634,000	\$2,760,000
Paperboard mills	\$248,000	\$266,000	\$152,000	\$666,000
All other converted paper product manufacturing	\$193,000	\$114,000	\$124,000	\$431,000
Plastics material and resin manufacturing	\$825,000	\$245,000	\$318,000	\$1,388,000
Other pressed and blown glass and glassware manufacturing	\$39,000	\$37,000	\$25,000	\$101,000
Glass product manufacturing made of purchased glass	\$252,000	\$119,000	\$133,000	\$504,000
Steel product manufacturing and nonferrous metal smelting	\$121,000	\$61,000	\$62,000	\$244,000
Iron foundries and Steel investment foundries	\$385,000	\$139,000	\$214,000	\$738,000
Nonferrous and aluminum metal foundries and die-casting foundries	\$112,000	\$51,000	\$69,000	\$232,000
Other commercial equipment merchant wholesalers	\$1,959,000	\$614,000	\$756,000	\$3,329,000
Industrial machinery and equipment merchant wholesalers	\$14,000	\$4,000	\$5,000	\$23,000
Recyclable material merchant wholesalers	\$3,733,000	\$1,299,000	\$1,341,000	\$6,373,000
Supermarkets and other grocery (except convenience) stores	\$1,346,000	\$290,000	\$389,000	\$2,025,000
Environmental consulting services	\$15,000	\$3,000	\$12,000	\$30,000
Solid waste collections and materials recovery facility*	\$6,517,000	\$1,765,000	\$2,695,000	\$10,977,000
Municipal Recycling Administration	\$592,000	\$210,000	\$611,000	\$1,413,000
TOTAL	\$17,438,000	\$6,256,000	\$7,540,000	\$31,234,000

TAX: FEDERAL

	Direct	Indirect	Induced	Total
Paper (except newsprint) mills	\$2,940,000	\$2,604,000	\$1,410,000	\$6,954,000
Paperboard mills	\$627,000	\$679,000	\$339,000	\$1,645,000
All other converted paper product manufacturing	\$720,000	\$353,000	\$275,000	\$1,348,000
Plastics material and resin manufacturing	\$1,934,000	\$501,000	\$715,000	\$3,150,000
Other pressed and blown glass and glassware manufacturing	\$112,000	\$101,000	\$56,000	\$269,000
Glass product manufacturing made of purchased glass	\$862,000	\$301,000	\$296,000	\$1,459,000
Steel product manufacturing and nonferrous metal smelting	\$361,000	\$166,000	\$139,000	\$666,000
Iron foundries and Steel investment foundries	\$1,365,000	\$420,000	\$476,000	\$2,261,000
Nonferrous and aluminum metal foundries and die-casting foundries	\$438,000	\$162,000	\$154,000	\$754,000
Other commercial equipment merchant wholesalers	\$4,940,000	\$2,127,000	\$1,680,000	\$8,747,000
Industrial machinery and equipment merchant wholesalers	\$32,000	\$13,000	\$11,000	\$56,000
Recyclable material merchant wholesalers	\$8,354,000	\$4,068,000	\$2,982,000	\$15,404,000
Supermarkets and other grocery (except convenience) stores	\$2,678,000	\$725,000	\$865,000	\$4,268,000
Environmental consulting services	\$77,000	\$12,000	\$26,000	\$115,000
Solid waste collections and materials recovery facility*	\$19,636,000	\$5,102,000	\$5,994,000	\$30,732,000
Municipal Recycling Administration	\$4,040,000	\$728,000	\$1,360,000	\$6,128,000
TOTAL	\$49,116,000	\$18,062,000	\$16,778,000	\$83,956,000
TAX: TOTAL

	Direct	Indirect	Induced	Total
Paper (except newsprint) mills	\$5,039,000	\$4,581,000	\$2,659,000	\$12,279,000
Paperboard mills	\$1,118,000	\$1,180,000	\$640,000	\$2,938,000
All other converted paper product manufacturing	\$1,054,000	\$550,000	\$520,000	\$2,124,000
Plastics material and resin manufacturing	\$3,469,000	\$998,000	\$1,340,000	\$5,807,000
Other pressed and blown glass and glassware manufacturing	\$185,000	\$170,000	\$105,000	\$460,000
Glass product manufacturing made of purchased glass	\$1,294,000	\$527,000	\$558,000	\$2,379,000
Steel product manufacturing and nonferrous metal smelting	\$586,000	\$279,000	\$262,000	\$1,127,000
Iron foundries and Steel investment foundries	\$2,031,000	\$666,000	\$899,000	\$3,596,000
Nonferrous and aluminum metal foundries and die-casting foundries	\$625,000	\$251,000	\$291,000	\$1,167,000
Other commercial equipment merchant wholesalers	\$8,555,000	\$3,137,000	\$3,170,000	\$14,862,000
Industrial machinery and equipment merchant wholesalers	\$59,000	\$20,000	\$20,000	\$99,000
Recyclable material merchant wholesalers	\$15,670,000	\$6,305,000	\$5,625,000	\$27,600,000
Supermarkets and other grocery (except convenience) stores	\$5,506,000	\$1,271,000	\$1,631,000	\$8,408,000
Environmental consulting services	\$95,000	\$18,000	\$49,000	\$162,000
Solid waste collections and materials recovery facility*	\$30,867,000	\$8,266,000	\$11,306,000	\$50,439,000
Municipal Recycling Administration	\$4,680,000	\$1,072,000	\$2,564,000	\$8,316,000
TOTAL	\$80,833,000	\$29,291,000	\$31,639,000	\$141,763,000