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The Economics of Recycling: Reports from States and Others

Prepared by the ASTSWMO Sustainable Materials Management Task Force
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Introduction

Recycling is an important strategy for environmental reasons. Using recycled materials for manufacturing uses less energy and creates less air and water pollution than manufacturing with virgin feedstocks. However, less well known is that recycling also has many economic benefits, including job and revenue creation. In order to educate our members and others about the economic benefits of recycling, the Sustainable Materials Management Task Force assembled this list of recent reports on the economic benefits of recycling. The time span of reports included is from 2007 to 2017. The compilation is intended to be dynamic. The list will be reviewed on a periodic basis and updated with additional resources as identified.

Disclaimer: This webpage includes links to informational resources created and maintained by other organizations. The websites listed are strictly for informational purposes. The Sustainable Materials Management Task Force does not control or guarantee the accuracy, relevance, timeliness, or completeness of this outside information. Further, the inclusion of links to particular websites is not intended to reflect an ASTSWMO endorsement of any views expressed on those sites.

Reports Included

State Reports

- **Alabama:**
 - [Economic Impact of Recycling in Alabama and Opportunities for Growth](#) - June 2012;
 - [A Plan for Boosting Residential Material Recovery and Recycling in Alabama](#) - August 2016
- **Colorado:** [Economic Study of Recycling in Colorado: Final Report](#) - November 2014
- **Iowa:** [Economic Impacts of Recycling in Iowa: Final Report](#) - December 2007
- **Michigan:** [Recycling in Michigan: Successful Recycling Programs, Best Practices and Diversion Potential. Final Report](#) - January 2016
- **North Carolina:** [Recycling in North Carolina: Momentum toward Sustainable Materials Management](#) - August 2011

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- **New Jersey:** [The Economic Benefits of Recycling and Waste Reduction – WasteWise Case Studies from the Private and Public Sectors](#) - 2013 (Updated 2015)
- **South Carolina:** [The Economic Impact of the Recycling Industry in South Carolina](#) - April 2014
- **Texas:** [Study on the Economic Impacts of Recycling](#) - July 2017

Multi-State Reports

- **Southeast Recycling Development Council (SERDC): Southeast U.S.:** 2010 - 2016
 - [Economic Impacts Reports on Recycling](#)
 - [Mapping Demand for Recycled Content Material](#)
 - [Recycling Demand Mapping in the Southeast](#)

National Reports

- **Environmental Protection Agency:** [Advancing Sustainable Materials Management: 2016 Recycling Economic Information \(REI\) Report](#) - October 2016
- **Institute of Scrap Recycling** - October 2017
 - [Economic Impact Study: U.S.-Based Scrap Recycling Industry \(2017\)](#)
 - [What is the Economic Impact in your Area - Interactive Website](#)
- **Tellus Institute with Sound Resource Management:** [More Jobs, Less Pollution: Growing the Recycling Economy in the U.S.](#) - 2011

Local Government Reports

- **Austin, Texas:** [The Current and Potential Economic Impacts of Austin Recycling- and Reuse-Related Activity](#) - Spring 2015
 - **King County, Washington:** [Recycling and Economic Development: A Review of Existing Literature on Job Creation, Capital Investment, and Tax Revenues](#) - April 2009
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State Reports

- **Alabama:**
 - [Economic Impact of Recycling in Alabama and Opportunities for Growth](#)
 - **Prepared by:** Alabama Department of Environmental Management, Land Division Solid Waste Branch
 - **Date:** June 2012
 - <http://www.adem.state.al.us/programs/land/landforms/CompleteEconomicsOfRecyclingAlabamaReport.pdf>

“This report provides the net value loss realized through the disposal of recyclable materials in Alabama MSW landfills in 2011 (\$218M). ... Coupled with the results of the [SERDC study](#) which determined that an increase of 10% in the state’s recycling rate could provide an additional \$3,000,000 in state tax revenue, \$66,000,000 in personal income and 1,400 new jobs, the over \$218,000,000 that could be realized through recycling of materials currently disposed as MSW provides real economic possibilities for Alabama.”

- [A Plan for Boosting Residential Material Recovery and Recycling in Alabama](#)
- **Prepared for SERDC and Alabama Recycling Partnership**

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- **Prepared by:** RME Associates Alabama Department of Environmental Management, Land Division Solid Waste Branch
- **Date:** August 2016
- <http://adem.alabama.gov/programs/land/landforms/ARPreportFinal.pdf>

“This report found that the recycling industry is an economic engine for Alabama. Modeling done for the state...revealed that the current level of recycling in Alabama generates a significant economic impact. ...Recycling in Alabama causes a direct impact of 32,400 jobs. As the people employed in those jobs spend money induced jobs are supported creating a total of 84,412 jobs. This generates economic activity estimated at \$19.4 billion.

The potential for greater economic benefit through expanded recovery of recyclables in Alabama is large enough to be pursued. The combined value of disposed materials, plus the cost in landfill tipping fees for disposal, is estimated at almost \$117 million annually. ...The estimated 711,436 tons of recyclables discarded in 2015 could represent almost 1,200 new direct jobs and would induce another 1,920 jobs for the state of Alabama.”

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- **Colorado:** [Economic Study of Recycling in Colorado: Final Report](#)
 - **Prepared for:** Colorado Department of Public Health & Environment
 - **Prepared by:** ENVIRON International Corporation
 - **Date:** November 2014
 - **Project Number:** 3034728A
 - https://www.colorado.gov/pacific/sites/default/files/DEHS_Environ_RecyclingInCO_FinalReport.pdf

“The overall purpose of the study was to identify the economic impacts the recycling, remanufacturing, and reuse (RRR) industry on the State economy, with particular focus on how RRR affects both urban and rural areas of the state. The study had several components: Data Gap Analysis; Survey Plan; Data Collection Report, and, Regional Impact Analysis.

Significant results of the analysis include the following conclusions:

- The direct impact of the RRR industries totals \$8.7 billion, with most of that (\$8.1 billion) occurring in the urban areas.
- The total impact of the RRR industries, including the direct, indirect, and induced impacts totals \$14.7 billion, with \$13.9 billion occurring in the urban areas.
- Given a total Gross State Product (GSP, or the state counterpart of GDP) of \$279.6 billion in 2012, RRR activities account for 3.1 percent of GSP in direct impacts, and 5.3 percent of GSP when considering the total impact from these sectors.
- The RRR industry impacts total nearly 86,000 jobs in the state representing 2.7 percent of overall employment in Colorado.
- Urban jobs in the RRR industry account for 80,394, or 2.9 percent of all urban employment, and rural jobs in the industry are estimated to total 5,433, or 1.2 percent of all rural employment.
- This employment translates to over \$200 million in labor wages in the rural region, and greater than \$5 billion in the urban region.
- Annual state and local tax revenue generated through the RRR industry is estimated at over \$80 million for the rural region and approximately \$1.2 billion for the urban region.”
- **Iowa:** [Economic Impacts of Recycling in Iowa: Final Report](#)
 - **Prepared for:** Iowa Department of Natural Resources

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- Prepared by: RW Beck and David Swenson Consulting
Date: December 2007
- www.iowadnr.gov/portals/idnr/uploads/waste/ecofullreport.pdf

“Overall, in 2005, the Iowa recycling industry reflected the following:

- More than \$159 million in commodity gross receipts based on estimated quantities of recyclable materials collected;
- 1,713 direct processing jobs and 3,096 in total recycling-related processing jobs (including organics, construction & demolition debris (C&D), Electronics, and Tires);
- 10,593 in direct end-use recycling industry jobs and more than \$4.064 billion in direct-industrial output;
- The remanufacturing and reuse industries provided more than \$431 million in total industrial output and 4,363 jobs;
- The recycling equipment industry provided more than \$154 million in total industrial output and 994 total jobs;
- For every 100 jobs created in the recycling processing industry, 81 additional jobs are sustained in the Iowa economy; and
- For every dollar in labor income created in the recycling processing industry, \$0.73 of additional income is sustained in the Iowa economy.”

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- Michigan: [Recycling in Michigan: Successful Recycling Programs, Best Practices and Diversion Potential. Final Report](#)
 - Prepared by: Northeast Michigan Council of Governments
 - Date: January 2016
 - https://www.michigan.gov/documents/deq/480235-14_NEMCOG_FINAL_RECYCLING_REPORT_521916_7.PDF

Note: The economic benefits is a small part of a bigger study that concerns all aspects of recycling.

- “The value of recycling material that is currently recycled, based on October 2015 Average Commodity Revenue for the Midwest, is approximately \$76 million, which is 70.1% of the value base on the average commodity value over the past 5 years.
- The quantity of landfilled but potentially recyclable material based on the types of material currently collected in recycling programs is approximately 1.879 million tons of material and represents 23.4% of the material landfilled.
- The value of landfilled but potentially recyclable material based on a 5-Year Average Commodity Revenue for the Midwest is approximately \$211 million, which is 143% of the value based on the current October 2015 commodity value.
- The estimation of the jobs related to recycling indicates that 68 jobs are created throughout all sectors, including collection, processing and recycled manufacturing for every 10,000 tons per year that are recycled.

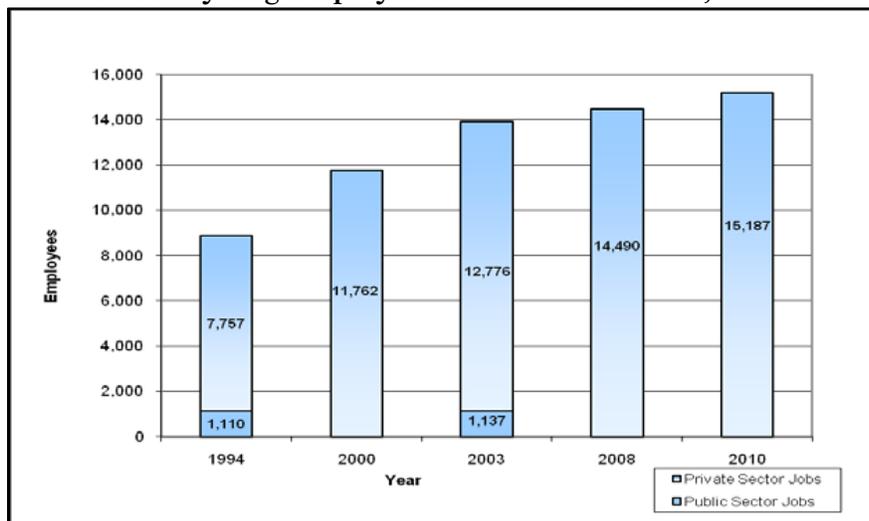
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- North Carolina: [Recycling in North Carolina: Momentum toward Sustainable Materials Management](#)

The Economics of Recycling: Reports from States and Others

- Prepared by: Division of Environmental Assistance & Outreach, North Carolina Department of Environment and Natural Resources
- Date: August 2011
- <https://files.nc.gov/ncdeq/Environmental%20Assistance%20and%20Customer%20Service/Reports%20and%20Studies/Recycling%20Report%202011.pdf>

“Recycling is steadily contributing to job creation and business growth in North Carolina, while also providing valuable materials to in-state manufacturers. NC DENR has conducted a series of recycling employment studies since 1994, recently doing more frequent analyses about every three years. Each successive study has documented recycling job growth in North Carolina, with a doubling of private sector employment between 1994 and 2010. Most impressively, recycling jobs grew by 4.8 percent through the most recent recession, even as general unemployment hit double digits across the state.”

Growth of Recycling Employment in North Carolina, 1994 – 2010:



- New Jersey: [The Economic Benefits of Recycling and Waste Reduction – WasteWise Case Studies from the Private and Public Sectors](http://www.nj.gov/dep/dshw/recycling/wastewise/njwwcasestudy.pdf)
 - Prepared by: New Jersey WasteWise Business Network
 - Date: 2013 (Updated 2015)
 - <http://www.nj.gov/dep/dshw/recycling/wastewise/njwwcasestudy.pdf>

Note: This report includes nine case studies of companies who save money by reducing waste disposal. “In New Jersey, recycling is an important segment of the state’s economy and one that employs approximately 27,000 people. What is even more important to the generators of waste, however, are the dollar savings that can be realized through recycling. Such savings are realized when the avoided cost of disposal, reductions in needed solid waste services and potential revenue from the sale of recyclables are factored into the overall equation. Of course, there are some costs associated program over time.”

- South Carolina: [The Economic Impact of the Recycling Industry in South Carolina](#)
 - Prepared by: Dr. Frank Hefner; College of Charleston, Dept. of Economics
 - Date: April 2014

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- <http://www.scdhec.gov/Library/CR-011380.pdf>

“This report shows that the recycling industry, which has grown from 340 companies in 2006 to more than 520 companies in 2014 in South Carolina, is responsible for:

- A total economic impact of more than 54,000 jobs in the state – a 44 percent growth from the 2006 study – and more than 22,000 direct jobs;
- An annual average wage of \$40,203 (higher than the average annual South Carolina wage for all jobs);
- Nearly \$2.7 billion in annual labor income – an increase of 80 percent from 2006;
- Nearly \$329 million in state and local taxes each year.

Overall, the recycling industry has doubled its total economic impact from \$6.5 billion in 2006 to \$13 billion in 2014.”

- **Texas: [Study on the Economic Impacts of Recycling](https://www.tceq.texas.gov/assets/public/assistance/P2Recycle/study/TheStudyontheEconomicImpactsofRecycling.pdf)**
 - **Prepared by: Burns & McDonnell**
 - **Prepared for: Texas Commission on Environmental Quality**
 - **Date: July 2017**
 - <https://www.tceq.texas.gov/assets/public/assistance/P2Recycle/study/TheStudyontheEconomicImpactsofRecycling.pdf>

This study was done to fulfill House Bill 2763, which directed the Texas Commission on Environmental Quality (TCEQ) to conduct a study on the economic impacts of recycling in Texas. Findings from the analysis included:

“...Recycling of MSW creates economic benefits for the Texas economy, with more than 17,000 person years of direct, indirect, and induced employment supported during 2015.... The overall impact of recycling MSW on the Texas economy exceeded \$3.3 billion. Collection activities generated the largest employment impacts, followed closely by processing facilities and end users. The recycling industry was also responsible for generating nearly \$195 million of revenue for state and local governments in 2015, through sales taxes, property taxes, and other taxes and fees. Expanding recycling activities has the potential to generate greater economic impact and public revenue, although these benefits may not be experienced uniformly throughout the state, due to local conditions that affect operating costs. Lastly, another potential benefit from the recycling of MSW is the siting of manufacturing facilities near the source of recycled feedstocks. Texas manufacturers that use recycled feedstocks supported almost 9,500 person years of employment during 2015.

Summary of Total Economic Impact of the Recycling Industry on the Texas Economy

Measure	Direct	Indirect	Induced	Total
Employment	7,868	5,040	4,129	17,037
Labor Income	\$342,862,641	\$314,883,480	\$199,242,509	\$856,988,630
Value Added	\$793,557,644	\$490,200,422	\$343,903,017	\$1,627,661,083
Output	\$1,894,943,170	\$875,280,989	\$606,533,341	\$3,376,757,500

Multi-State Reports

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- **Southeast Recycling Development Council (SERDC):** For Alabama, Arkansas, Florida, Georgia, Kentucky, Louisiana, Mississippi, North Carolina, South Carolina, Tennessee, Virginia
 - Prepared by: SERDC | Southeast Recycling Development Council
 - Date: 2010-2016
 - SERDC: [Economic Impacts Reports on Recycling](#)
 - <http://www.serdc.org/econreports>

“SERDC has compiled a list of various reports focused on the economic impacts of recycling in the Southeast. It is easy to see that the recycling industry has a great impact on the economies of the southeastern states.”

- SERDC: [Mapping Demand for Recycled Content Material](#)
- <http://www.serdc.org/regionalresources>

Includes individual reports on 1) Understanding State by State Demand for Recycled Material and 2) Understanding the Job Creation Driven By Recycling.

“In a 2010 study, SERDC determined that over 200 key Southeastern manufacturers look to recycled feedstock to develop new consumer goods. When communities invest in local recycling collection programs, they’re supporting regional manufacturers who depend on recycled plastic, glass, metal, and paper to make new consumer goods. These manufacturers collectively support more than 47,525 employees and see a sales volume towering more than \$29.4 billion.”

- SERDC: [Recycling Demand Mapping in the Southeast](#)
- <http://www.serdc.org/maps>

“In a new 2016 study, SERDC determined that over 350 key Southeastern manufacturers look to recycled feedstock to develop new consumer goods. These manufacturers collectively support almost 98,000 jobs and see a sales volume towering more than \$40 billion.”

National Reports

- **Environmental Protection Agency: [Advancing Sustainable Materials Management: 2016 Recycling Economic Information \(REI\) Report](#)**
 - Project Number: EPA530-R-17-002
 - Date: October 2016
 - <https://www.epa.gov/smm/2016-recycling-economic-information-rei-report-and-methodology>

“It is estimated that in 2007, recycling activities contributed 757,000 jobs (0.52% of all jobs in the U.S. economy), \$36.6 billion in wages (0.62% of total wages paid), and \$6.7 billion in tax revenues (0.90% of total revenues). ...When normalized on a per 1,000-short-ton basis, the estimates indicate that 1,000 tons of recycled material attributes 1.57 jobs, \$76,030 in wages and \$14,101 in tax revenues. Construction and

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demolition provided the largest contribution to all three categories considered (job, wage and tax revenue), followed by ferrous metals, and non-ferrous metals (aluminum).”

Metric	Total	Percentage of U.S. Economy (2007)
Jobs	757,325	0.52%
Wages	\$36,636,597,000	0.62%
Tax Revenue	\$6,795,244,000	0.9%

- **Institute of Scrap Recycling: Economic Impact Studies**
 - Prepared by: John Dunham and Associates
 - Date: October 2017
 - Executive Summary: [Economic Impact Study: U.S.-Based Scrap Recycling Industry \(2017\)](#)
 - [http://www.isri.org/docs/default-source/recycling-analysis-\(reports-studies\)/economic-impact-2017_updatedfinal.pdf?sfvrsn=4](http://www.isri.org/docs/default-source/recycling-analysis-(reports-studies)/economic-impact-2017_updatedfinal.pdf?sfvrsn=4)
 - Interactive website: [What is the Economic Impact in your Area](#)
 - <http://www.isri.org/policy-regulations/economy#.We5x5FtSyiV>

“The study confirmed that the U.S. scrap recycling industry plays a prominent role as an economic leader, job creator and major exporter. Specifically, the study found that the people and firms that purchase, process and broker old materials to be manufactured into new products in America provide 534,506 adults with good jobs in the United States and generate more than \$116.97 billion annually in economic activity. All told, the U.S. scrap recycling industry accounts for 0.63 percent of the nation’s total economic activity, making it similar in size to the data processing and hosting industry, the dental industry, and the automotive repair industry.”

National Impacts from 2017 Study	Direct	Supplier	Induced	Total
Jobs	155,632	175,587	203,287	534,506
Wages	\$11,908,224,800	\$11,679,223,300	\$10,722,931,500	\$34,310,379,600
Economic Impact	\$43,816,864,000	\$38,604,351,600	\$34,544,879,500	\$116,966,095,100

- **Tellus Institute: [More Jobs, Less Pollution: Growing the Recycling Economy in the U.S.](#)**
 - Prepared by: Tellus Institute with Sound Resource Management
 - Date: 2011
 - <http://www.tellus.org/pub/More%20Jobs,%20Less%20Pollution%20-%20Growing%20the%20Recycling%20Economy%20in%20the%20US.pdf>

“This study provides strong evidence that an enhanced national recycling and composting strategy in the United States can significantly and sustainably address critical national priorities including climate change, lasting job creation, and improved health. Achieving a 75 percent diversion rate for municipal solid waste (MSW) and construction and demolition debris (C&D) by 2030 will result in:

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A total of 2.3 million jobs: Almost twice as many jobs as the projected 2030 Base Case Scenario, and about 2.7 times as many jobs as exist in 2008. There would be a significant number of additional indirect jobs associated with suppliers to this growing sector, and additional induced jobs from the increased spending by the new workers.

The job creation data reveal that waste disposal is not labor intensive and generates the fewest jobs per ton of waste (0.1 job per 1,000 tons) for the various management activities.

Processing of recyclables (2 jobs per 1,000 tons) and organics (0.5 jobs per 1,000 tons) is somewhat more labor intensive. Manufacturing using recycled materials creates a relatively high number of jobs per 1,000 tons, varying by material/sector (e.g., about 4 jobs per 1,000 tons for paper manufacturing and iron and steel manufacturing, and about 10 jobs per 1,000 tons for plastics manufacturing). Though relatively small tonnages of material are involved, MSW reuse and remanufacturing activities are particularly job intensive owing to the labor required for disassembly, inspection, repair/refurbishment, reassembly, and testing.

In 2008 there were approximately 861,000 jobs directly associated with the management of MSW and C&D (666,000 and 195,000, respectively). Though more than two-thirds of MSW and C&D waste was disposed in 2008, only about 15 percent of the jobs associated with managing these wastes were from disposal related activities (collection and landfilling or incineration).

By contrast, because of the labor intensity of waste diversion, 85 percent of the jobs were associated with various diversion activities (collection, processing, manufacturing with recycled materials, and composting). Jobs associated with manufacturing using recycled inputs accounts for about 44 percent of the total jobs created related to MSW management and 24 percent of C&D management related jobs. Recycled material collection and processing also creates a significant fraction of the overall jobs for both MSW (37 percent) and C&D (33 percent).

Local Government Reports

- **Austin, Texas:** [The Current and Potential Economic Impacts of Austin Recycling- and Reuse-Related Activity](#)
 - Prepared by: TXP, Inc
 - Prepared for: City of Austin
 - Date: Spring 2015
 - https://austintexas.gov/sites/default/files/files/EGRSO/TXP_Austin_Recycling_Report_Final.pdf

“The City of Austin commissioned TXP, Inc. to evaluate the recycling and reuse sectors’ economic impact. The report that follows is based on evaluation of data, industry and overall economic trends, input from local stakeholders, and literature and best practices review. The following table shows the current total economic impact and the additional impact of bringing local recycling-related manufacturing up to the national average.”

Table 1: Total Current & Potential Impact of Austin MSA Recycling Activity (\$2014)

NAICS Codes	Output/Receipts	Earnings/Payroll	Employment
Manufacturing (3261, 327215, 3314)	\$105,075,647	\$21,080,902	464
Wholesale	\$534,424,333	\$45,817,140	1,036

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(423140, 423930)			
Solid Waste Recovery (562111, 562920)	\$80,291,063	\$42,995,720	1,173
Current Total	\$719,791,043	\$109,893,762	2,673
<i>Additional Manufacturing-Related</i>	<i>\$363,860,498</i>	<i>\$72,999,862</i>	<i>1,606</i>
Potential Total	\$1,083,651,541	\$182,893,624	4,278

- **King County, Washington:** [Recycling and Economic Development: A Review of Existing Literature on Job Creation, Capital Investment, and Tax Revenues](#)
 - Prepared by: Cascadia Consulting
 - Prepared for: King County
 - Date: April 2009
 - <http://your.kingcounty.gov/solidwaste/linkup/documents/recycling-economic-development-review.pdf>

“This report presents key findings summarized from more than 50 existing studies, reports, web sites, journal articles, media releases, and presentations addressing the impacts of recycling on job creation, capital investment, and tax revenues.

A. Recycling creates jobs and income.

A-1. Most of the studies reviewed suggest that, on a national scale, the recycling industry has been creating jobs and increasing its overall share of the labor market. In fact, recycling has consistently been shown to create more jobs—at higher income levels—than landfilling or incineration of waste.

A-2. In some states, recycling currently employs fewer people than the waste disposal industry; however, employment per ton of material recycled has been reported to be almost ten times greater than employment per ton of material disposed.

A-3. Individuals employed in the recycling industry showed higher average income figures than statewide average income levels for a majority of reporting states, including California, Iowa, Minnesota, Michigan, Indiana, North Carolina, and Washington. In these states, recycling incomes also were higher than average disposal industry incomes.

A-4. In the United States, paper mills, steel mills, plastics converters, and iron and steel foundries account for 50 percent of all recycling industry employees; 62 percent of recycling industry wages; and 59 percent of total recycling industry receipts.

B. Recycling programs usually provide a reliable and attractive return on capital investment.

B-1. As of 2007, the recycling industry accounted for about 2 percent of the \$12.36 trillion U.S. gross domestic product.

B-2. In recent years, the recycling industry has begun to attract significant capital investment from the private sector, a trend which is expected to continue as the quality of recycled materials improves and virgin resources become more costly.

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B-3. Non-ferrous metals and plastics have the highest economic value per ton of material; glass and yard waste have the lowest sales value. No single recycled materials market dominates the industry, but investment opportunities are concentrated in five major material categories: steel, non-ferrous metals, paper and paperboard, plastics, and electronics.

C. Recycling boosts public revenues in a number of ways—not just taxes.

C-1. Nationally, the recycling and reuse industries are reported to generate approximately \$12.9 billion in federal, state, and local tax revenues, with 80 percent going to federal and state governments. Reported actual state and local tax revenue amounts varied significantly or were not available in the literature.

C-2. Reported taxable revenues and wages that recycling contributes to national, state, and local economies are significant. These contributions are not always translated into tax dollars in the literature, but the benefits are clearly implied.

C-3. In addition to earned tax revenues, cities, counties, and states realize real, quantifiable cost savings in environmental protection and public health that are directly or indirectly tied to the success and growth of the recycling industry. Cost savings and benefits include reductions in landfill and disposal costs, energy consumption, greenhouse gas emissions, and pollution.

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