



MEASURING RECYCLING IN THE STATE OF MICHIGAN: 2014 RECYCLING RATE

FINAL REPORT | NOVEMBER 2016

COMMISSIONED BY THE MICHIGAN DEPARTMENT OF ENVIRONMENTAL QUALITY



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OVERVIEW

In April 2014, Governor Snyder announced a statewide recycling initiative with the aim of boosting material recovery through public education and technical assistance, providing convenient access to recycling and developing markets that will capture an increasing stream of recycled content. The plan established benchmarking and measurement as a first step, and the Michigan Recycling Coalition received a pollution prevention grant from the Michigan Department of Environmental Quality (MDEQ) to conduct the measurement, leading to development of Michigan Recycling Index. The project's task was to measure access to recycling throughout Michigan, evaluate participation in recycling, and calculate the rate of recycling for municipal solid waste (MSW).

To achieve this goal, the Michigan Recycling Index (MRI) team worked with sponsors and partners to gather information from many recycling stakeholders in the state including Michigan communities, material recovery facilities, yard waste facilities and take-back program operators. Information sharing was voluntary for all parties, and the MRI team did not receive full data from every recycler in the state, with different types of data proving more readily available than others. To account for data gaps, the project team developed an extrapolation model to make reasonable projections for those regions. In addition to a base recycling rate calculation, conservative and aggressive scenarios were examined for each material category to reflect levels of certainty, and were expressed as a range.

The result of the MRI project was an estimate of the state recycling rate that can be used to support state leadership and funding in materials management, attract public and private sector investments, increase the availability of low cost, environmentally beneficial feedstock to manufacturers, and improve program performance at all levels.

The MRI first measured the state's recycling rate for the year 2013. In 2015, MDEQ wanted to update the baseline recycling rate that was estimated by the MRI project. MDEQ contracted with Resource Recycling Systems to update the model first used in the MRI project. To update the 2013 recycling rate, a subset of data was collected from processing facilities for the year 2014 and compared to baseline data from 2013. For the measurement update, the project team contacted 129 communities that participated in the previous survey and received responses from 37 of those communities.



A minimum of two outreach attempts were made to each of 42 material recovery facility (MRF) operators in Michigan identified by RRS. However, processing facilities, like many private companies, are often hesitant to share information on their business operations. Many declined to participate in this study or did not respond to phone calls and emails. In total, RRS and MDEQ were able to collect information from 10 MRF operators representing 14 facilities in Michigan.

The project team also collected a variety of data from MDEQ and the Michigan Department of Treasury, including the value of returned bottle deposits, the amount of organic material delivered to registered compost sites, and the weight of electronics recycled in 2014. This data was used in the model in conjunction with data from communities and MRFs to paint a complete picture of recycling in Michigan.

This data and the year-over-year changes represented by it were used to model total recycling in Michigan based on community and household-level projections. In addition to a base recycling rate calculation, a low case and a high case for each modeled material category was developed to establish the upper and lower bounds of a range that reflects the rate to a high level of certainty based on modeled assumptions.

DATA CONFIDENTIALITY

Data was collected from public entities such as municipal and county recycling programs that are less concerned with the privacy of information being shared. At the same time, many of the processing facilities, material recovery facilities and collectors/transporters of recycled material are privately held and have reservations about disclosing information that may be considered proprietary or sensitive to business operations. For this reason, RRS made a commitment to the safe handling of sensitive data that was submitted through the survey process.

METHODOLOGY

To meet the state's objectives of determining the diversion rate for municipal solid waste (MSW) and profiling access to recycling opportunities throughout Michigan, RRS collected data from a variety of Michigan organizations, businesses and programs that recycle or compost material from the municipal waste stream. Diverted quantities were captured through a survey administered to MRFs seeking tonnages of material recycled by communities or facilities. Tonnage was obtained from a portion of survey respondents. Additional tonnage data was received from take-back programs, discussed in more detail below.

MATERIAL FLOWS

The MRI considered MSW in Michigan to be divided into three primary streams: disposal, recycling, and compost, as described below. RRS followed this system in updating the recycling rate for the year 2014.

Disposed Material

Disposed material from Michigan is either sent to a Michigan landfill, sent to a Michigan incinerator, or shipped out of state. The first two categories are quantified through the DEQ's reports of solid waste landfilled in Michigan as well as and public reports on the quantity of solid waste disposed at Michigan incinerators. Michigan is believed to be a net importer of solid waste so the third category is relatively small. In determining the total quantity of disposed material, incinerator ash was excluded from the total landfilled volume, as this waste was accounted for pre-incineration via the data from Michigan incinerators.

Recycled Material

Recycled material from Michigan is processed in three ways: it may be sorted at a Michigan MRF, sorted at an out-of-state MRF, or sold to brokers and/or end users without further sorting. The study measured material collected by communities, counties, and take-back programs, as well as material sorted at Michigan MRFs through a MRF survey. These MRFs included single, dual and multi-stream MRFs and operations that are baling source separated materials. The project model assessed material that may have been sorted at out-of-state MRFs through survey questions for communities, counties, and haulers.

Composted Material

Composted material from Michigan is processed into finished mulch and compost either at Michigan compost facilities or out-of-state compost facilities. MRI collected data on the first category via surveys of counties and compost facilities; and via data from the DEQ's annual report required for licensed compost facilities. The survey detected and accounted for material through the county surveys and through annual reports to the DEQ. Only large scale commercial composters were considered for MSW diversion; onsite, backyard composting was not part of the study as it is excluded from the EPA's definition of MSW.

TAKE-BACK PROGRAMS

A variety of materials diverted from a destination as MSW are collected through take-back programs. Examples include electronic waste, textiles and beverage containers that are included in the state's 10-cent bottle deposit system. The project team gathered information from the following take-back programs, either through data provided by MDEQ or another state agency.

E-Waste

MDEQ provided a report on the total tonnage of electronic waste that was reported recycled by those registered with the state's electronics program in the 2014 program year, covering October 2013 through September 2014.

Textiles

Approximately fifteen textile collectors are operating in the state of Michigan through a variety of take-back channels including nearly 7,000 bins, store drop-offs and free household collection services. The state's most prominent non-profit and for-profit textile collectors were contacted with a request to provide information concerning the amount recycled in Michigan and collected information on the market and supply chain for these materials. Additionally, generation and supply chain information was collected directly from the national association which tracks these textile statistics, Secondary Materials and Recycled Textiles (SMART). Quantities for specific take-back programs were obtained and total aggregate quantities of material were projected in 2013; the project team assumed this figure was unchanged in 2014.

Household Hazardous Waste

Data on household hazardous waste was obtained directly from MRFs that responded to the MRF questionnaire. Additionally, data was provided by ePaint Recycling (epaintrecycling.com), representing the total amount of paint that was collected from Michigan communities in 2013 through the ePaint program and the project team assumed this figure was unchanged in 2014.

Container Deposits

Michigan container deposit data is recorded in unredeemed deposit revenue, and must be converted to material tonnage accordingly. RRS received data on the volume of 2013 container deposit returns from the Michigan Department of Treasury. Using data provided by the Department of Treasury, RRS calculated the number and material composition of total deposits redeemed, then projected the total tonnage with average container weights for each material (metal, glass and plastic) commonly used.

Tires

Tire recycling data was obtained from MDEQ, representing data that was voluntarily reported to the MDEQ Office of Waste Management and Radiological Protection, as many end users are not mandated to report commodity usage. Data considered for incorporation into the recycling rate includes 2014 tonnage that went into septic, sidewall rings and other products such as playground equipment, rubber rock chips, and crumb. Since Tire Derived Fuel (TDF) is not considered recycling, the tonnage reported by each processor making TDF was divided evenly by the number of product types they reported, though it is unknown exactly what fraction of that material is used for each end product.

Batteries

For the 2013 MRI project, the Project Team collected information from the Association of Battery Recyclers for an industry-leading calculation methodology for measuring lead acid battery recycling. The resultant extrapolation provided what was determined to be an aggressive scenario, especially when benchmarked against an alternative approach following a US EPA protocol. The MRI team utilized a blended approach for the baseline calculation, and utilized these reference approaches for aggressive and conservative scenarios in the sensitivity analysis. RRS relied on the same approach in updating the recycling rate. These assumptions were unchanged for the 2014 model.

Data obtained on other rechargeable batteries was from Call2Recycle, the primary take-back program for rechargeable batteries and mobile phones operated by US manufacturers of rechargeable batteries. Call2Recycle provided a total volume of batteries collected in Michigan in 2014.

QUANTITY DISPOSED

Disposal tonnage was retrieved from annual fiscal reports of solid waste landfilled in Michigan, as well as from reported data from two incinerators in the state including Kent County and the Greater Detroit Resource Recovery Authority. Landfill disposal quantities were adjusted to avoid double-counting incinerator ash, then added to the total incoming quantities of incinerated materials less the recovered metal quantities, yielding a total disposed tonnage of 8,026,443 tons.

Disposed MSW is reported to the MDEQ in cubic yards, and reported material quantities are converted to tons using both generic and material-specific conversion factors. These conversions may have a significant impact on disposal data accuracy.

THE RECYCLING RATE

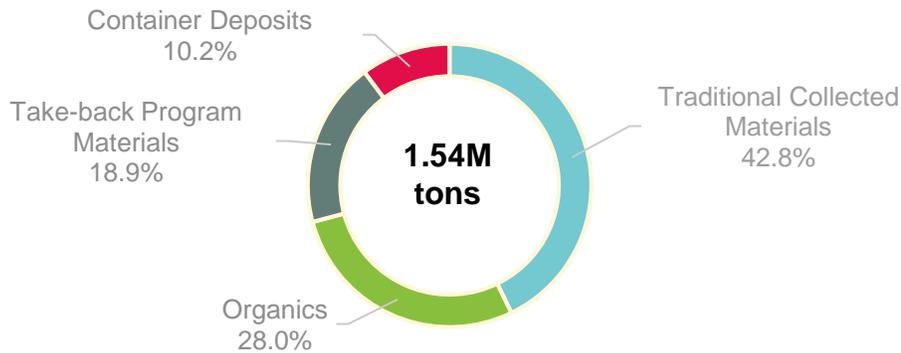
In 2014, the State of Michigan achieved a total statewide MSW recycling rate of 15.3%. Of the total amount of material recycled, only 43% is composed of ‘traditional’ recyclable materials collected from commercial and residential sources. Twenty-eight percent of the total is composted organics, mostly yard waste. The container deposit program accounts for 10%, and other source separated streams (such as lead-acid batteries, white goods, tires, e-waste, and textiles) make up the remaining 19%.

The MRI survey process followed the recommended survey guidelines established by the US EPA for measuring recycling rates, and submitted data was applied directly to the respondent communities. Additionally, data received was used as the basis for an extrapolation of recycling activity to gap communities which have analogous and relevant demographic characteristics that are likely to be reflected through recycling performance. The types of data collected and the data collection methods are described below.

HIGHLIGHTS

- Michigan achieved an estimated MSW recycling rate of 15.3% in 2014, with a high-certainty range of between 13.3% to 18.8% based on the parameters in this study.
- 43% of MSW recycled is made up of “traditional” recyclable materials collected from commercial and residential sources. 28% of the total is composted organics. Other source separated streams, such as lead-acid batteries, white goods, tires, electronic waste and textiles, make up the remaining 19%.
- Composted material reported to MDEQ increased by approximately 17% in 2014 over 2013.
- Collected data suggests an overall increase in material recycled through material recovery facilities of approximately 12%.

$$\frac{\text{TONS RECYCLED}}{\text{TONS RECYCLED} + \text{TONS DISPOSED}} = \text{RECYCLING RATE} = \frac{1,535,195 \text{ TONS}}{1,535,195 \text{ TONS} + 8,502,670 \text{ TONS}} = 15.3\%$$



RESULTS

- Information sharing was voluntary and the project team received data from nine private and public entities operating 13 Michigan MRFs. This participation represents Michigan's largest recycling facilities and includes approximately 40 to 60% of the total throughput from material recovery facilities in the state of Michigan.
- Container deposits accounted for 10.2% of 2014 recycled MSW, or 1.6% of total MSW.
- In 2013, the volume landfilled was 21,581,275 cubic yards, and this volume increased by 5.3% in 2014 to 22,715,636 cubic yards. In 2013, 881,953 tons of material was incinerated,

increasing by 11.9% to 986,660 tons in 2014. If disposed volumes were to have remained steady year over year, the overall recycling rate would be 16.1%.

- In 2014, 3,459,241,584 containers were redeemed as part of the Michigan container deposit scheme, yielding 161,387 tons of high-value materials including plastics, metals and glass. This is relatively consistent relative to 2013.
- Composted material was approximately 441,843 tons in 2014.

SIGNIFICANT CHANGES FROM 2013

- Michigan's estimated MSW recycling rate of 15.3% is an increase of 0.3% over the 2013 rate.
- Container deposits accounts for 10.2% of recycled MSW in Michigan, or 1.6% of MSW.
- 44% of MSW recycled is made up of "traditional" recyclable materials collected from commercial and residential sources, while 26% of the total is composted organics, and other source separated streams (such as lead-acid batteries, white goods, tires, e-waste, and textiles) make up the remaining 19%.
- Some specific material categories were not updated from 2013 due to limited data availability, including paint, white goods and textiles.
- 19,627 tons of electronics were reported as recycled in 2014, a decrease of 20% from 2013.
- Tire recycling increased 40% in 2014 over 2013, with 79,758 tons of tires recovered.

KEY RECOMMENDATIONS

- A variety of strategies will be instrumental in achieving a recycling rate of 30%. These should include best management practices that would help local governments optimize material flows. MDEQ should consider conducting a regional gap analysis to determine where best management practices are needed most.

- MDEQ should consider selecting a community to host a tangible and scalable demonstration project designed to implement BMPs to increase recycling recovery. The pilot project could incorporate an analysis of data on recycling tonnages to demonstrate improvements.
- Residential recycling improvements are important, but must be paired with an emphasis on organics and commercial material. Improvements to residential curbside recycling alone will not be sufficient to achieve this goal.
- Better information to allow tracking the movement of commercial material will increase confidence in estimated commercial material quantities.
- MDEQ should continue to collect and model data on the state's recycling rate for calendar year 2015, before Public Act No. 55 has taken effect.
- We recommend a phased approach for data analysis beginning in 2016, for two reasons. First, Public Act No. 55 requires reporting of recycling quantities beginning October 1, 2016, meaning a full year of reported data will not be available until 2017 data is reported in the year 2018. Second, starting in October, companies will self-report information. There may be errors and adjustments as recyclers transition to the new system, making the first few years of data unreliable. The phased approach will ensure a smooth transition to utilizing reported data.
- A phased approach could be handled in different ways. Our recommendation is that for calendar year 2016, MDEQ should conduct an analysis using 25% reported data and 75% modeled data. For calendar year 2017, MDEQ should conduct an analysis using 50% reported data and 50% modeled data. For calendar year 2018, MDEQ should conduct an analysis using 75% reported data and 25% modeled data.
- When collecting data for this study, MDEQ should include gathering economic information that will be useful to economic development agencies and others who are working to bring recycling businesses to Michigan or who are working to connect MRFs with buyers of materials and buyers with reprocessors. Information may include, but is not limited to, number of employees, years in business, historical business information, or others. MDEQ should work with the Michigan Economic Development Corporation to refine the specific data points to be collected.
- MDEQ should rely on an external party to conduct the data analysis for all years, both to avoid the potential for the appearance of bias and to ensure that the transition between modeled and reported data is handled such that data for reported years can be reasonably compared to data from modeled years.



APPENDIX: MRC PRESENTATION

The results of the recycling rate update were presented at the 2016 Michigan Recycling Coalition Annual Conference on May 2, 2016. A copy of the presentation describing the project follows.



DOUBLING MICHIGAN'S RECYCLING RATE

The Second Year

*THE US WASTE & RECOVERY SYSTEM



Municipal Solid Waste

2013 US Recovery Rate*
34.3%

Landfill 52.8%

Waste to Energy 13%



Avg organics
recycling rate is
8.9%



Avg recycling
rate is
25.4%



Avg tipping
fee is
\$49.78/ton



Largest 20% of
MRFs account for
**50% of recycling
throughput.**

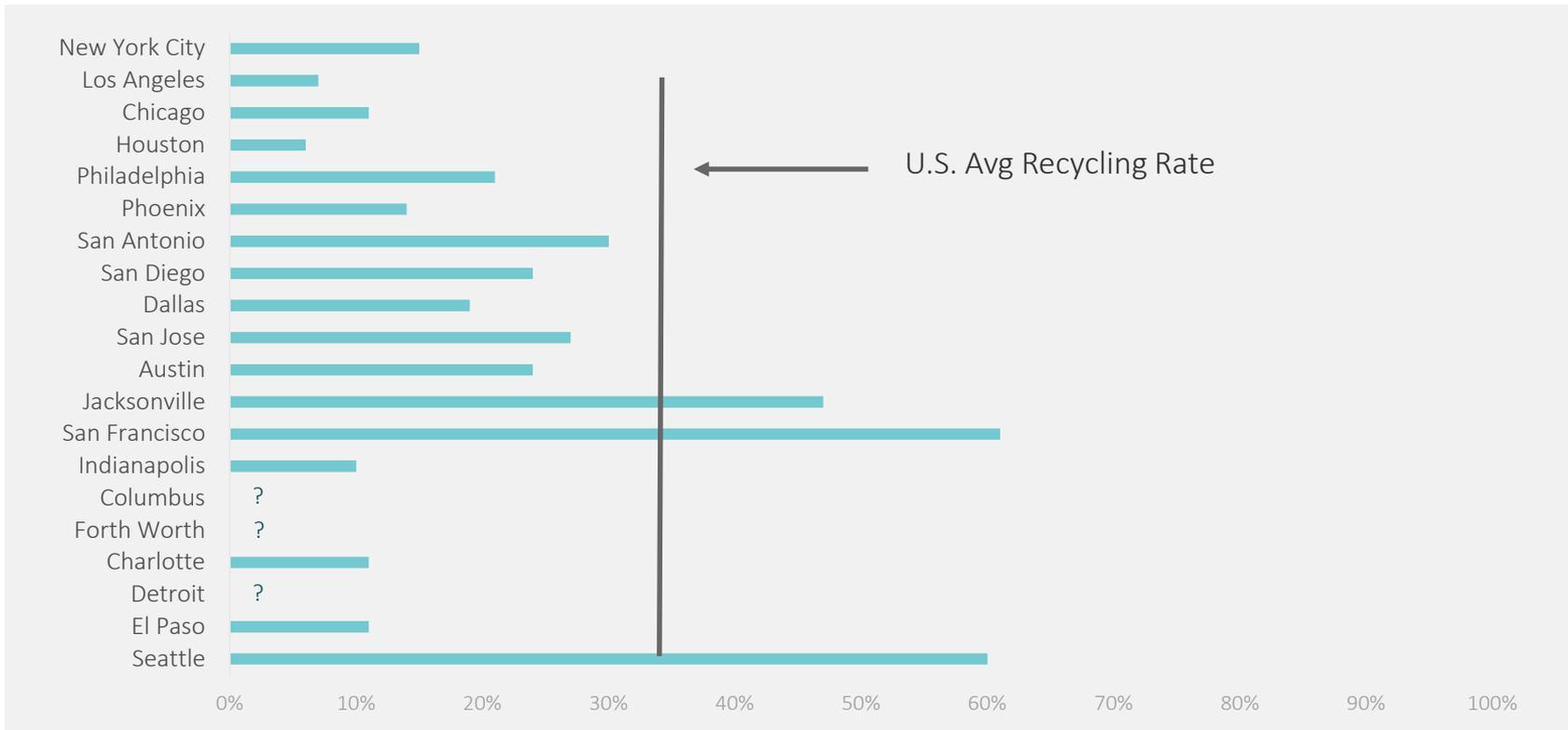


Aspiration

- Zero Waste
- Circular Economy

*US EPA defines Recovery Rate as Recycling and Composting. C&D is accounted for separately.

* 20 LARGEST U.S. CITIES and CURBSIDE RECYCLING RATES



Curbside data from Resource Recycling, May 2015. Other data from city website and reports. * Dallas, San Antonio include organics diversion, Phoenix includes organics and commercial diversion. LA is 2011 data – source: UCLA School of Engineering; San Francisco (2013 McBride), Seattle is 2014.

* THE FOCUS FOR TODAY and GOAL FOR TOMORROW



EASILY DIVERTED
Recyclable Materials

HARDER TO DIVERT
Organics

CHALLENGING TO DIVERT

MANAGEABLE?

30-40%

20-30%

10%

20%

Today

Emerging

Tomorrow

Unknown



MICHIGAN RECYCLING RATE
15%





THE REALITY OF RESIDENTIAL RECYCLING



Only about 70% of the waste stream can be recycled or composted.

20% IMPOSSIBLE TO RECOVER

Diapers, painted Christmas trees, cat feces, broomsticks, skateboard wheels



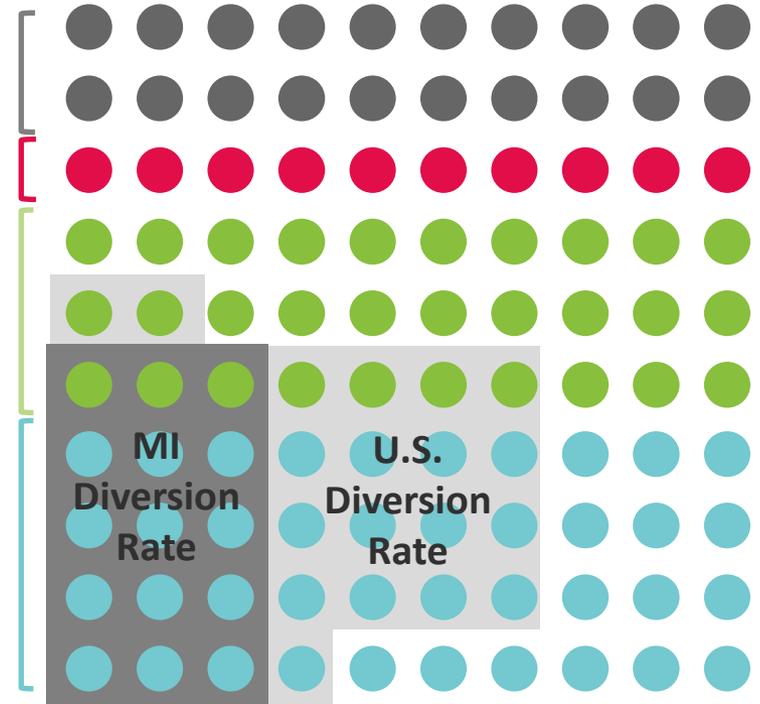
10% CURRENTLY NOT ABLE TO RECOVER

Toothpaste tubes, sandwich bags, lip balm tubes, drink pouches, contact lens packaging



70% RECYCLABLE/COMPOSTABLE

Water bottles, soda cans, newspapers, cardboard boxes, yard debris, food scraps



* MEASURING RECYCLING IN MICHIGAN



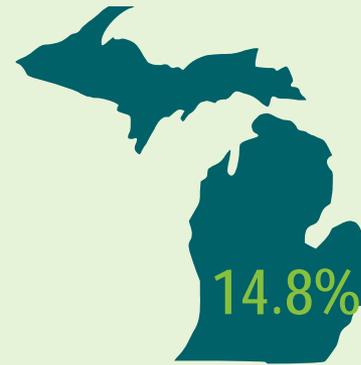
- Gov. Snyder's statewide recycling initiative identified benchmarking and measurement as an important first step to increasing recycling
- Last year, the Michigan Recycling Index team performed a study to measure access to and participation in recycling in Michigan and to calculate a recycling rate



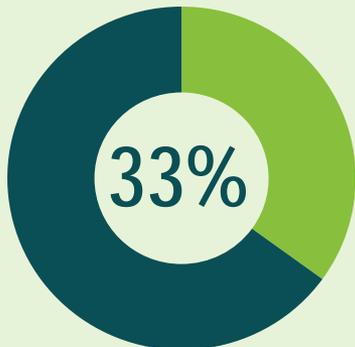
* THE 2013 STATE OF RECYCLING IN MICHIGAN



As of 2013, every resident in **25 of 83 counties** had convenient access to residential recycling opportunities



Michigan's 2013 recycling rate



of Michigan households have minimal or no access to convenient recycling



National 2013 recycling rate

* 2014 METHODOLOGY



1 Start with 2013
MRI work



2 Called MRFs to get
tons recycled in 2014



3 Called communities
to find tons recycled
in 2014



4 Updated information on
tons of compost, tires,
bottle deposits, and other
data available on recycling



5 Modeled available data
against communities
where no data was
available



6 Estimated state
recycling rate

* THE STATE OF RECYCLING IN MICHIGAN



Michigan's
recycling rate



14.8% → 15.3%

2013 2014

National
recycling rate



* RECYCLING'S IMPACT ON THE ECONOMY

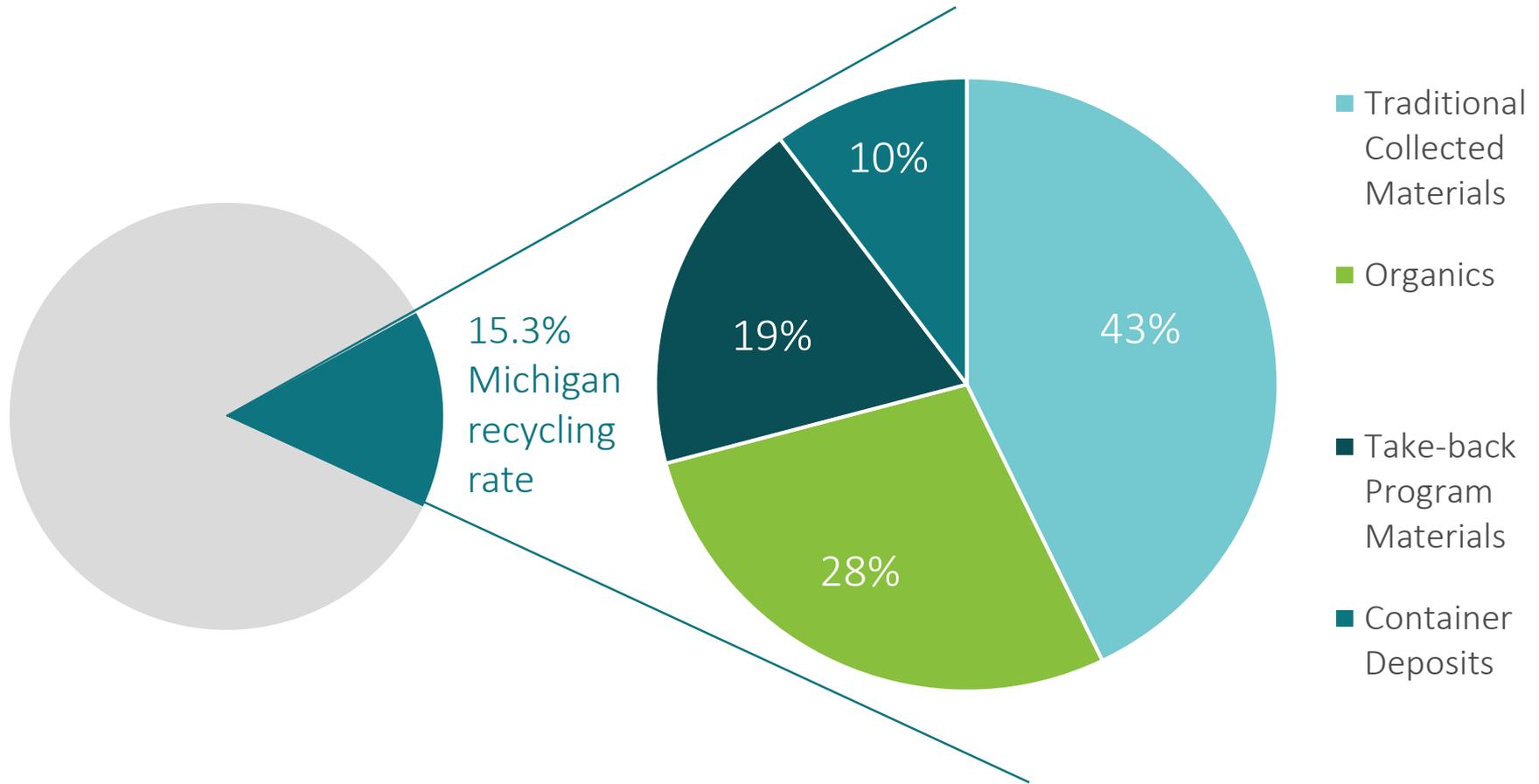


The recycling, reuse and recovery industry in Michigan results in **35,954 direct jobs**



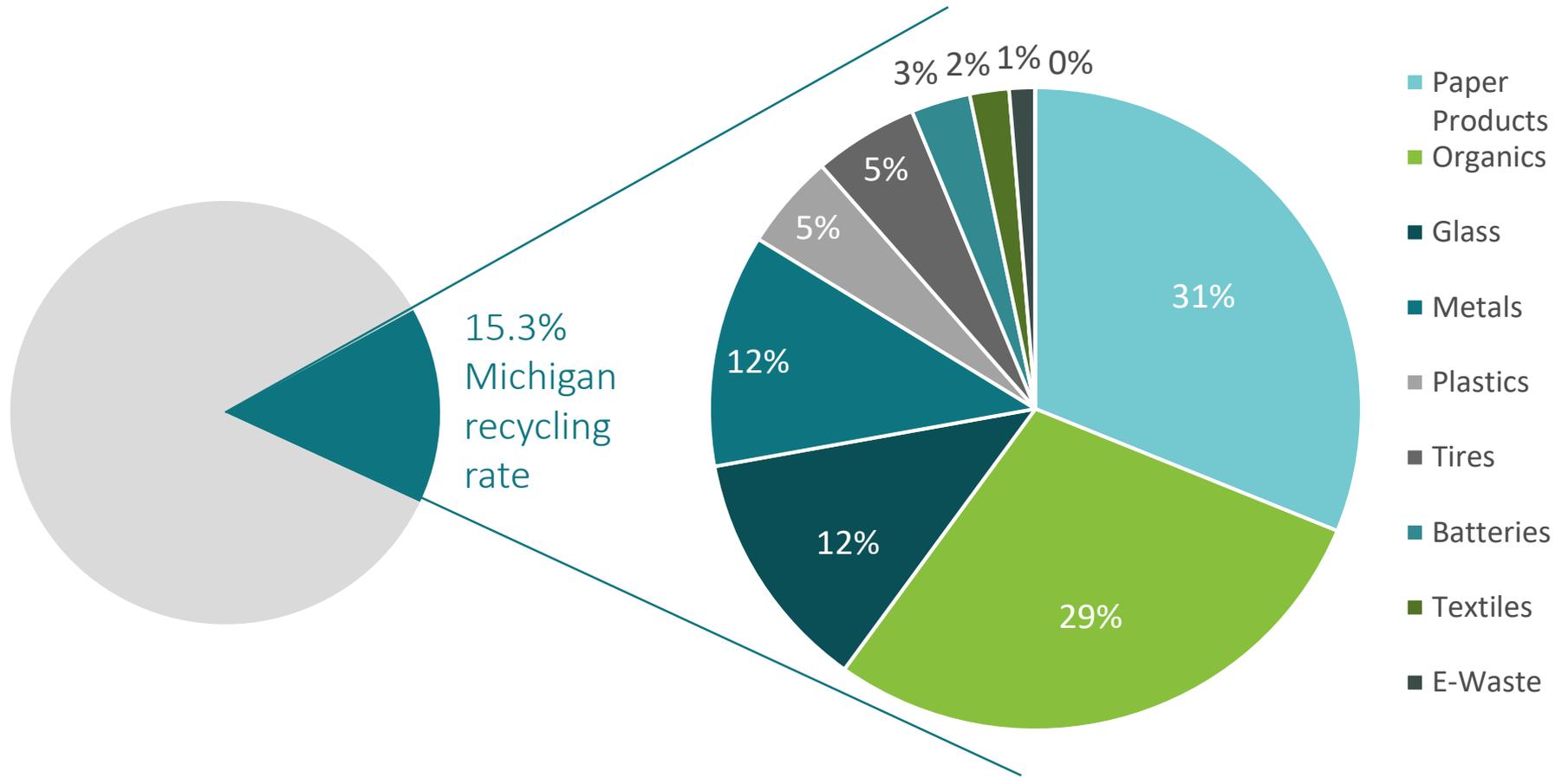
Overall, the RRR industry accounts for **1.74%** of total employment in Michigan and **2.56%** of the state's total economic output

* WHAT MICHIGAN RECYCLED IN 2014





2014 RECYCLING STREAM COMPOSITION

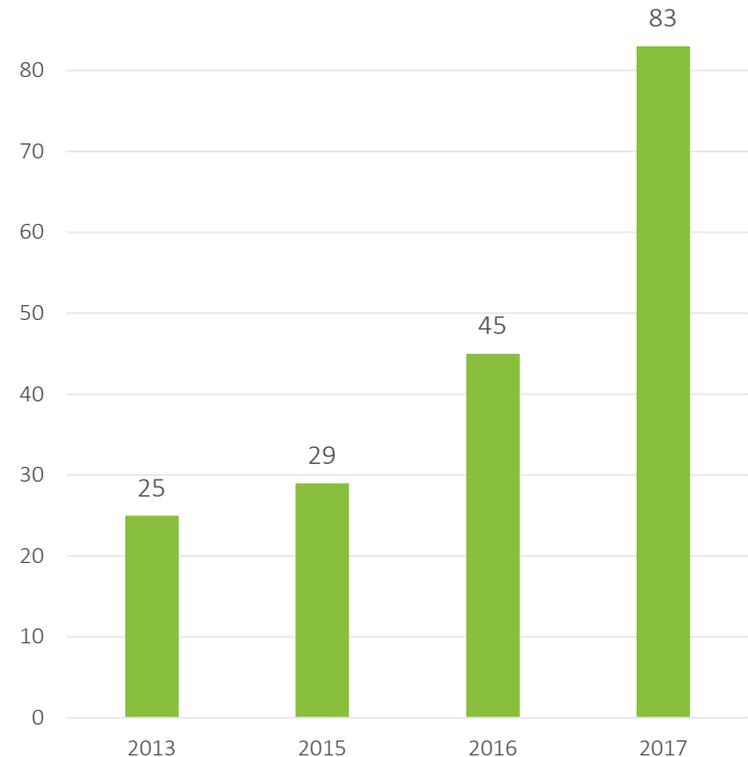


* MICHIGAN'S GOALS



1. Increase the number of counties with convenient access to residential recycling to:
2015 – 29 counties
2016 – 45 counties
2017 – 83 counties
2. Increase statewide participation in recycling to above the Great Lakes states average by December 2017

Michigan's Goal for Number of Counties with Convenient Access to Residential Recycling



* CHANGES SINCE 2013



	2013	2014
Pounds recycled per household	443 lbs/hh	481 lbs/hh
Average pounds per household recycled – residential programs	218 lbs/hh	224 lbs/hh
Tons disposed	8,026,444	8,502,670
Tons recycled	1,395,225	1,535,881
Tons composted	378,097	441,843
Recycling rate	14.8%	15.3%
Range	12.9%-18.7%	13.3% - 18.8%

* NOTABLE RECYCLING PROGRAM GROWTH SINCE 2010



2010

- City of Grand Rapids
- Dearborn
- City of Midland

2011

- Huntington Woods

2014

- City of Saline
- City of Milan
- Town of Mundy
- City of Marquette
- City of Detroit
- City of Lansing
- Romeo

2015

- City of East Lansing
- Melvindale
- Bloomfield Hills
- Plymouth Twp
- Southgate
- Romulus
- City of Portage

2016

- City of Battle Creek
- Howell
- *Emmet Cty*
- *Clinton Twp*
- City of Bronson

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* WHAT IS REQUIRED TO LIFT
MICHIGAN'S RECYCLING RATE TO 30%?
Recommendations from the Governor's Recycling Summit



1 Improve current curbside programs to best practice recovery levels.

2 Expand curbside programs to all high density areas.

3 Increase best practice access to curbside carts for all single-family homes.

4 Increase commercial recycling and improve reporting of commercial recycling activity.

5 Capture 1/3 of food waste statewide (both residential and commercial)

1

IMPROVE CURRENT CURBSIDE PROGRAMS TO BEST PRACTICE RECOVERY LEVELS.



On average Michigan's curbside recycling programs recycle **226 pounds per household per year**, but high participation curbside programs across the country recycle **550 pounds per household per year**.

BEST PRACTICES

roll carts

weekly collection

smart contracting

strong education

BEST RESULTS

WHAT IS MICHIGAN DOING?

In 2015, Michigan awarded \$635,500 in Community Pollution Prevention grants to 14 projects that support growing recycling access and participation.

2

EXPAND CURBSIDE PROGRAMS TO ALL HIGH DENSITY AREAS.

* In Michigan, access to convenient curbside programs is



Only 61 percent



WHAT IS MICHIGAN DOING?

The Governor's Recycling Council recommended legislation that would improve access to curbside recycling. In addition, the MDEQ has developed outreach materials for local governments and recycling service providers to assist in creating the policies and programs that will result in expanded recycling access and participation.

3

INCREASE
BEST
PRACTICE
ACCESS TO
CURBSIDE
CARTS FOR
ALL SINGLE-
FAMILY
HOMES.

* Carts vs. Bins



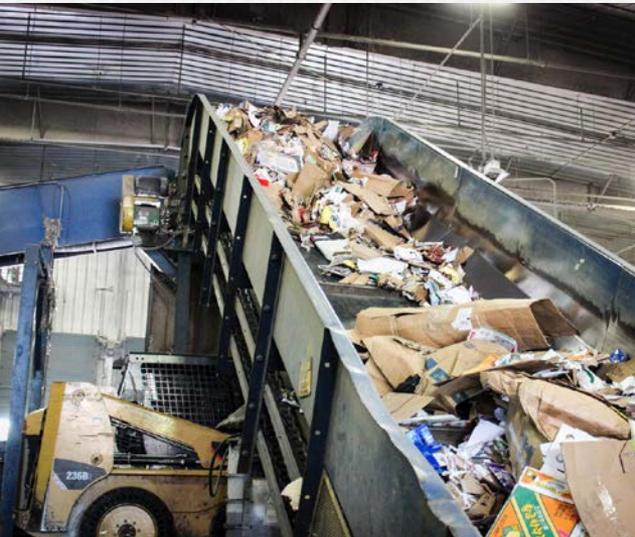
WHAT IS MICHIGAN DOING?

DEQ initiated the 2016 Cart Grant and today announced nine Michigan communities will receive financial and technical support to transition from bins to carts. The \$450,000 of DEQ grant funding will be used to leverage over \$947,000 in match funding in nine Michigan communities. With the help of local waste-hauling businesses, these grant projects will provide 31,592 Michigan households with curbside recycling carts and increase projected total recycling volumes more than 8.7 million pounds each year.



4

INCREASE COMMERCIAL RECYCLING AND IMPROVE REPORTING OF COMMERCIAL RECYCLING ACTIVITY.



- * Commercial recycling is poorly documented in state reported data.



WHAT IS MICHIGAN DOING?

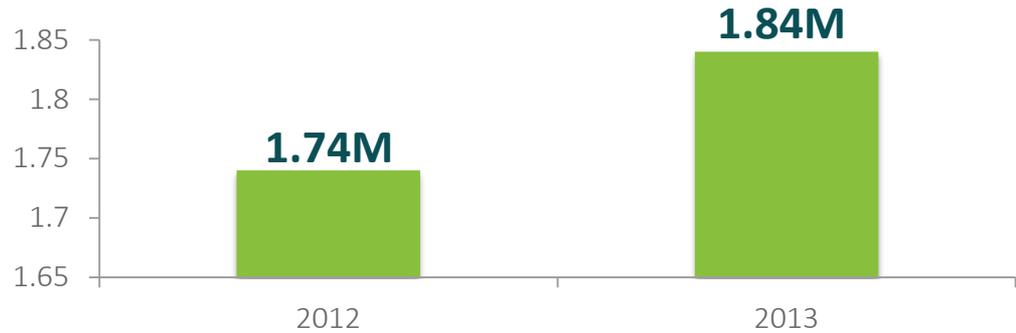
MDEQ has worked with stakeholders to develop recycling measurement and reporting legislation which was approved in early 2016. Implementation of the legislation will take place during the second half of 2016.

5

CAPTURE 1/3
OF FOOD
WASTE
STATEWIDE
(BOTH
RESIDENTIAL
AND
COMMERCIAL)

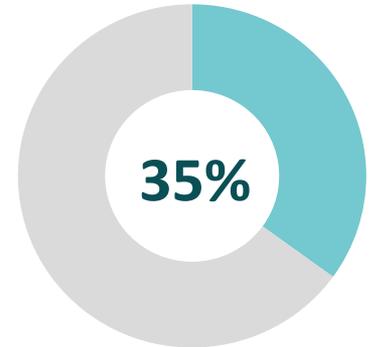


* Nationally, the composting of food rose from 1.74 million tons in 2012 to 1.84 million tons in 2013.



* **35% of Michigan households**

have access to curbside composting for yard waste – adding food waste to these households could allow Michigan to piggyback on existing infrastructure and hauling routes.



WHAT IS MICHIGAN DOING?

This year the Community Pollution Prevention Grants focused on reducing and diverting food waste. \$241,800 was awarded to four grantees.

**Measuring the
recycling rate**
is not our goal.



* Our goal is to use that data to **increase Michigan's recycling rate and improve recycling for everyone in Michigan.**

* How is MDEQ working towards the Governor's goals?



On October 1, 2014, MDEQ received the first of two \$1 million appropriations to implement the Governor's recycling plan. The \$1 million appropriation for FY16 has been signed. MDEQ is using those funds to create momentum that will move the state toward accomplishing the Governor's recycling goal by focusing on five pillars of action:

1

Lead by
Example

2

Measure and
Analyze

3

Market
Development

4

Increase
Access and
Participation

5

Education
and Outreach

1

FIVE PILLARS OF ACTION

Lead by Example



MDEQ is:

- * Improving recycling at state office buildings;
- * Expanding recycling opportunities at state parks and rest areas;
- * Requiring state leasing bids to specify available recycling services; and
- * Exploring the use of recycled products in road building projects.



2

FIVE PILLARS OF ACTION

Measure & Analyze



- * Gov. Snyder established the Governor's Recycling Council (GRC) and appointed 9 members
- * GRC advises MDEQ on implementation of the Governor's Residential Recycling Plan and goal of achieving a 30% residential recycling rate within 2 years
- * MDEQ selected ReTRAC to develop web-based collection system for state's recycling data.
- * MDEQ developing expanded Recycled Materials Market Directory.



3

FIVE PILLARS OF ACTION

Market Development



MDEQ has:

- * issued an RFP to collect comprehensive end-use and supply chain data and expand the Market Directory.
- * Hired a new Recycling Market Development Specialist to:
 - Support recycled commodity markets, and
 - Ensure Michigan businesses can secure high-volume, clean, recycled commodities for manufacturing processes.



4

FIVE PILLARS OF ACTION



Increase Access & Participation

- * MDEQ conducting regional recycling meetings to identify issues and encourage collaboration.
- * Stakeholders include local government organizations and waste and recycling industry organizations.
- * Pollution Prevention grants awarded to 14 organizations, totaling \$250,000 in FY 2014 and \$635,500 in FY 2015.
- * In FY 2016, MDEQ is forming an outreach campaign for grant opportunities.



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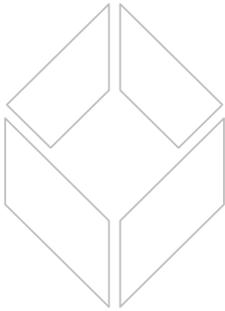
FIVE PILLARS OF ACTION

Education & Outreach



- * MDEQ created 4 Recycling and Waste Minimization Specialists positions to provide technical assistance at regional level.
- * The Governor's Recycling Summit was held on May 5, 2015 in conjunction with the MRC's annual conference, attracting over 500 attendees.
- * A second Governor's Recycling Summit is planned for 2016.
- * MDEQ pursuing the "Recycle, Michigan" campaign signs and branding for state parks, rest areas, and other outreach efforts.





MANAGING CHANGE IN A RESOURCE-CONSTRAINED WORLD

RRS is a consultancy with a vision. We see a world where resources are managed to maximize economic and social benefit while minimizing environmental impact. A world where abundance keeps pace with societal needs.

We have assembled a unique team of strategists, engineers, economists and communications specialists with core strengths in materials and recovery, coupled with expertise in life cycle management and applied sustainable design. These experts operate confidently across the supply chain, identifying the most leveraged opportunities to affect change, and developing pathways to long-term value.

RRS has been working toward this vision since 1986. Our clients are leaders in materials management, and in partnership we have achieved outstanding results. We remain nimble and responsive, providing informed, innovative, actionable solutions to the sustainability challenges of our time.