



National Framework for Advancing the U.S. Recycling System



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Preface

The *National Framework for Advancing the U.S. Recycling System* is the product of a multi-stakeholder collaborative effort that began on November 15, 2018. On that day, EPA hosted the first America Recycles Day Summit, which for the first time ever brought together stakeholders from across the U.S. recycling system to join EPA in signing the America Recycles Pledge. Participants included representatives from federal, local, state and tribal governments; the recycling industry; non-profits; manufacturers; and product brands, who worked collaboratively over the course of 2019. All 45 signing organizations, including EPA, pledged to work together to identify specific actions to take in addressing the challenges and opportunities facing the U.S. recycling system.

Through the pledge, organizations committed to leveraging their collective expertise, strengths and resources to address these challenges and opportunities. Workgroups were formed to address four critical areas for action: promoting education and outreach, enhancing materials management infrastructure, strengthening secondary materials markets, and enhancing measurement. These action areas have been continually underscored and reaffirmed as the primary areas of need to address the challenges facing our recycling system.

This document summarizes the activities and accomplishments of the workgroup participants in 2019 and lays out the path forward for continued action in 2020. It also provides a foundation on which additional actions can be identified and taken. It is only through collective action that the needed systemic change will occur. EPA encourages all to build on this *National Framework*, work with others across the materials value chain and become actively engaged in improving our recycling system.

In recognition that collective and collaborative commitments are best achieved when there are common goals, all interested stakeholders are encouraged to work with EPA in developing national recycling goals over the course of 2020. The national recycling goals will provide a benchmark for progress to inspire innovation, investment and action across the American recycling system.

EPA looks forward to continuing this collaborative effort to build a strong, resilient U.S. recycling system.



Executive Summary

Recycling is an important driver of the United States' economy and a way to conserve our resources and protect the environment. The U.S. Environmental Protection Agency's Recycling Economic Information Report found that, in a single year, recycling and reuse activities in the United States accounted for 757,000 jobs, \$36.6 billion in wages and \$6.7 billion in tax revenues. This equates to 1.57 jobs, \$76,000 in wages and \$14,101 in tax revenues for every 1,000 tons of material recycled. In addition, recyclable materials with a commodity value of approximately \$8.9 billion are sent to landfills annually. Recycling also reduces the amount of waste sent to landfills and incinerators; conserves natural resources such as timber, water and minerals; and reduces pollution sources by reducing the need to extract new raw materials. While the benefits of recycling are clear, growing and strengthening the U.S. recycling system to support domestic industries and enhance environmental and community benefits will require multi-stakeholder collaboration to address the challenges currently facing the system. Current challenges include:

- Confusion about what materials can be recycled, which often leads to placing recyclables in the trash or throwing trash in the recycling bin or cart;
- Outdated recycling infrastructure that is ill-equipped to keep pace with today's diverse and changing waste stream;
- Reduced export markets for recycled materials, requiring domestic markets to be strengthened; and
- Varying methodologies to measure recycling system performance used across the country make it difficult to create effective goals and track progress.

On November 15, 2018, EPA Administrator Andrew Wheeler hosted the America Recycles Day Summit, which brought together stakeholders from across the U.S. recycling system to join EPA in signing the America Recycles Pledge. All 45 signing organizations, including EPA, pledged to work together to identify specific actions to take to address the challenges facing the U.S. recycling system. Through the pledge, organizations committed to leveraging their collective expertise, strengths and resources to address these challenges and opportunities. Participants included representatives from federal, local, state and tribal governments; non-governmental associations, the recycling industry; manufacturers and product brands. Following the 2018 America Recycles Summit, EPA worked with the organizations that signed the America Recycles Pledge to form workgroups aligned with four critical action areas:

- Promote Education and Outreach
- Enhance Materials Management Infrastructure
- Strengthen Secondary Material Markets
- Enhance Measurement

EPA recognizes that many organizations are working together to improve the resiliency of the U.S. recycling system. The activities highlighted in this *National Framework* are not intended to be a comprehensive list of all work underway; but rather, present a selection of activities voluntarily provided by organizations within the America Recycles Network.¹

The workgroup participants' 2019 priority actions are summarized in Table 1. It should be noted that while the total number of pledge signers has grown to over 165 from the original 45 in 2018, the priority actions identified originated from the 45 organizations that signed the America Recycles Pledge on November 15, 2018. EPA also identified and committed to undertaking several actions to address multiple action areas, summarized in Table 2.

Workgroup participants also identified and are considering an additional set of activities for 2020, summarized in Table 3.

¹ The America Recycles Network includes all of the America Recycles Pledge signatories. It is continually growing and expanding in number.

Table 1: America Recycles Workgroup 2019 Priority Actions

America Recycles Workgroup 2019 Priority Actions				
Critical Action Area	Stakeholder Concern or Challenge	Actions(s)	Purpose	Anticipated Timeframe
Promote Education and Outreach	Public awareness of how to recycle properly	Announce key messages on recycling issues for public and media audiences in the form of an infographic. Led by Keep America Beautiful, The Recycling Partnership, and the Sustainable Packaging Coalition.	Provide information emphasizing positive messages about the U.S. recycling system.	November 2019
Enhance Infrastructure	Outdated infrastructure in need of upgrades	Compile available funding opportunities around the country for infrastructure investments.	Provide an overview of funding resources available to supplement organizations' efforts across the system.	November 2019
Strengthen Secondary Materials Markets	Support existing and develop new-end markets	The National Recycling Coalition, in partnership with EPA, the State of Texas Alliance for Recycling and the California Resource Recovery Association, successfully hosted three market development workshops across the country.	Initiate efforts to spur market development across the country. Review of 2019 workshops will occur in 2020 to identify actions implemented as a result of the workshops.	August and October 2019
		Develop and release a market-development toolkit for governments, materials recovery facilities, and secondary processing facilities.	Provide FAQs, guidance on how to conduct cost vs. benefit analysis for investments, incremental and major enhancements, planning for future materials, and contracting best practices to ensure the capability to meet current and future needs.	Spring 2020

America Recycles Workgroup 2019 Priority Actions

Critical Action Area	Stakeholder Concern or Challenge	Actions(s)	Purpose	Anticipated Timeframe
Enhance Measurement	Find new, improved ways of measuring to help tell the story of recycling progress and results	Compile information on a range of recycling metrics and measures.	Provide a range of metrics and measures for use by organizations across the recycling system, including definitions, the types of analyses these metrics and measures support, where in the recycling process these measures/metrics apply, available data available, data gaps/needs, quality of data, and pros and cons of the various measures.	2020
		Develop draft definition of “recycling,” which organizations can choose to adopt.	Help foster more consistent recycling data reports across multiple organizations, which will in turn help improve measurement and tracking of recycling across the country.	November 2019
		Publish a recycling system map that depicts the flow of materials through the system.	More accurate materials flow information will inform infrastructure needs and market development opportunities.	November 2019
Cross-Cutting Action that Supports All Action Areas	Need centralized information on recycling resources to improve education and outreach and measurement, strengthen markets and enhance infrastructure	Launch a publicly accessible, web-based portal that will serve as a clearinghouse for recycling tools and resources. Led by the Chamber of Commerce Foundation in partnership with U.S. EPA, the Institute of Scrap Recycling Industries and Keep America Beautiful.	Provide a one-stop-shop virtual resource for information about recycling issues on a well-maintained platform.	Initial launch in November 2019; Continued expansion in 2020

Table 2: EPA 2019–2020 Actions

EPA 2019–2020 Actions				
Critical Action Area	Stakeholder Concern or Challenge	Actions(s)	Purpose	Anticipated Timeframe
Promote Education and Outreach	Improve public awareness of efforts underway to strengthen the U.S. recycling system	Publish pledge signatory success stories and Veteran's Stories.	Showcase the goals and accomplishments of America Recycles Pledge signatories as well as the veterans they employ.	November 2019
		Publish WasteWise Partner success stories in honor of WasteWise's 25 th Anniversary.	Celebrate the 25 th Anniversary of WasteWise and demonstrate the success and measurable results of organizations participating in WasteWise and provide examples of scalable recycling activities.	November 2019
	Reduce contamination of the recycling stream	Develop a pilot educational campaign to encourage recycling through retail/alternative collection programs, thus decreasing the amount of plastic film entering curbside collection programs.	Reduce contamination of the recycling stream, along with safety hazards that plastic bags can cause at materials recovery facilities.	April 2020
Enhance Materials Management Infrastructure	Lack of access to recycling facilities in some parts of the country	Develop a national map of existing recycling infrastructure.	Build on existing information to provide a clearer picture of the current domestic recycling infrastructure and support efforts to identify gaps and needed investments.	April 2020
Strengthen Secondary Materials Markets	Support existing end-markets and increase demand for secondary materials	Develop options for an incentive-based voluntary program focused on increasing recycling as well as the demand for post-consumer recyclable materials.	Help strengthen and increase domestic demand for post-consumer recyclable materials and serve as a stimulus in U.S. markets for materials collected through recycling programs, encourage sustainable management of collected materials, and mitigate reliance on export markets.	November 2020

EPA 2019–2020 Actions				
Critical Action Area	Stakeholder Concern or Challenge	Actions(s)	Purpose	Anticipated Timeframe
Enhance Measurement	Need new and improved ways of measuring	Revise the 1997 document <i>Measuring Recycling: A Guide for State and Local Governments</i> .	Serve as a tool for states to help standardize reporting information, including separating residential and commercial streams.	November 2020
	Diversity and variety of measurements	Update EPA's Recon Tool, which calculates environmental benefits associated with recycled content material.	Provide data and information to the public about the environmental benefits associated with use of recycled content material.	Spring 2020
		Work with other federal agencies and seek public input in establishing national recycling definitions. Work with states to understand different measurement methodologies for measuring diversion rates.	Foster common definitions and understanding different approaches to measuring diversion rates to help improve national measurement.	Summer 2020
		EPA will seek input from the America Recycles Network organizations and the public to establish national goals to increase recycling in 2020.	Stimulate and inspire new actions and initiatives to increase recycling in the U.S. and increase consumer awareness of the need to recycle right.	November 2020
Cross-cutting Actions to Support Multiple Action Areas		Release <i>National Framework for Advancing the U.S. Recycling System</i> .	Articulate actions taken to-date and the intended actions for 2020.	November 2019
		Continue facilitating workgroup meetings and dialogues, including hosting future meetings to implement and develop new actions within the <i>National Framework</i> .	Support the continued, sustained collaboration among the 165+ pledge signatories by continuing to lead and facilitate workstream activities as outlined in this <i>National Framework</i> .	Ongoing in 2020
		Conduct webinars and outreach on the clearinghouse to increase resources/information included in the web-based tool.	Support growth and expansion of the publicly available resources.	Ongoing in 2020

The America Recycles Workgroup participants also identified and are considering an additional set of activities for 2020, summarized in Table 3 below.

Table 3: Recommended 2020 Actions Under Consideration

Recommended 2020 Actions Under Construction				
Critical Action Area	Stakeholder Concern or Challenge	Actions(s)	Purpose	Anticipated Timeframe
Promoting Education and Outreach	Inconsistent messaging	Develop and make available a set of common recycling messages on nationally-significant issues (e.g. plastic film/bags), building off the efforts of workgroup participants.	Increase awareness of how to recycle correctly and help reduce contamination of the recycling stream.	November 2020
	Reducing contamination			
	Inconsistent messaging	Evaluate the feasibility of a national public relations campaign to lay the foundation for common messaging on nationally significant materials or issues. The campaign could be directed at engaging youth or other audiences.	A national public relations campaign focused on nationally significant issues has the potential to reach broad audiences and have a significant impact by increasing participation in recycling while reducing contamination.	April 2020
	Increase public awareness about how to recycle			
	Reducing contamination	Share information about available free, open-source, downloadable labels for recycling bins.	Help reduce contamination of the recycling stream.	February 2020
Enhance Materials Management Infrastructure	Improve resiliency of outdated infrastructure	Conduct and compile research on successful infrastructure investments and potential investment opportunities.	Provide valuable information to the public.	July 2020
		Continue support for and share results and outcomes of the “Materials Recovery for the Future” pilot project.	Assess potential for replication and expansion.	April 2020

Recommended 2020 Actions Under Construction

Critical Action Area	Stakeholder Concern or Challenge	Actions(s)	Purpose	Anticipated Timeframe
	Pricing Localized differences	Explore the creation of incentives to encourage investment in recycling and compile existing tax incentives.	Help MRFs become more resilient to future market fluctuations and enable them to meet the challenges posed by the evolving materials stream.	November 2020
Strengthen Secondary Materials Markets	Support existing end-markets	Measure the success of the NRC-EPA workshops by assessing results and follow-up activities by participating states. Expand and host workshops in other parts of the country.	Support national markets by strengthening regional markets, and ultimately market expansion.	February 2020
Enhance Measurement	New and improved ways of measuring	Use the workgroup definition of recycling and the recycling system diagram to create metrics for measuring recycling.	Inform the development of more accurate data on recycling activities.	Spring 2020 through November 2020
	Diversity and variety of measurements	Develop additional draft definitions associated with materials flow through the system.		
		Develop a central compilation of data and metrics used to measure recycling or components of the recycling system.		
		Compile results of workgroup activities (definitions, material flow map, metrics, and measures) for integration into <i>Measuring Recycling: A Guide for State and Local Governments</i> .		



Introduction

Most Americans want to recycle, as they believe recycling provides an opportunity for them to protect our environment. However, it can be difficult for consumers to understand what materials can be recycled, how materials can be recycled, and where to recycle different materials. This confusion often leads to placing recyclables in the trash or throwing trash in the recycling bin or cart.

America's recycling infrastructure has not kept pace with today's waste stream. Communication between the manufacturers of new materials and products and the recycling industry needs to be enhanced to prepare for and optimally manage the recycling of new materials.

Domestic markets for recycled materials need to be strengthened in the United States. Historically, some of the recycled materials generated in the United States have been exported internationally. However, changing international policies have limited the export of materials. There is also a need to better integrate recycled materials and end-of-life management into product and packaging designs. Improving communication among the different sectors of the recycling system is needed to strengthen the development of existing materials markets and to develop new innovative markets.

Stakeholders across the recycling system agree that more consistent measurement methodologies are needed to measure recycling system performance. These more standardized metrics can then be used to create effective goals and track progress.

On November 15, 2018, EPA Administrator Andrew Wheeler hosted the America Recycles Day Summit, which brought together stakeholders from across the recycling system to join EPA in signing the America Recycles Pledge. That day, forty-five signatories, including EPA, pledged to work together to identify specific actions to take in addressing the challenges and opportunities facing the U.S. recycling system. Following the 2018 Summit, EPA worked with the organizations that signed the America Recycles Pledge to form workgroups aligned with four critical action areas:

1. Promote Education and Outreach
2. Enhance Materials Management Infrastructure
3. Strengthen Secondary Material Markets
4. Enhance Measurement

The workgroups began meeting in January 2019. EPA released a status report of the progress made in July 2019. The *National Framework for Advancing the U.S. Recycling System* articulates the progress made to-date, including priority actions in 2019, EPA 2019-2020 actions, and recommended actions the workgroups are considering undertaking in 2020.



Promote Education and Outreach



Most Americans believe recycling provides an opportunity for them to protect our environment. However, it can be difficult for consumers to understand what materials can be recycled, how materials can be recycled, and where to recycle different materials. This confusion often leads to placing recyclables in the trash,

or trash in the recycling bin or cart, contaminating recyclable streams and contributing to the disposal of valuable materials. In addition, the growing number of new materials in the form of products and packaging means that the landscape of recyclable materials is constantly changing. Finally, there needs to be an increased awareness of the importance of buying products containing recycled content and recycling them at their end-of-life. The development of effective, adaptive and coordinated outreach and education strategies for consumers is critical to promoting consistent behaviors that will improve the quality and quantity of materials that Americans recycle. It also will result in stronger markets for recyclable materials and an increase in demand for products with recycled content.

Vision

Develop clear, consistent messages about proper materials management activities that enable consumers to recognize the value of reusing, recovering and recycling materials, as well as the value of buying products with recycled content.

Challenges

Workgroup participants identified three key challenges: inconsistent messaging on how to recycle due to localized differences; lack of information on contamination; and limited public awareness of the value of recycling.

Inconsistent messaging

- Messaging on how to recycle is inconsistent and not nationalized, allowing for regional and local differences in collection and recycling programs and the loss of valuable materials from the recycling system.

Priority Action

Collaborate to develop consistent messages for key recycling issues as a key priority action. Build upon ongoing work and success stories. Include the benefits of recycling, the importance of buying products with recycled content, and preventing contamination of recycling streams.

Contamination

- Contamination from recyclable products occurs when products are labeled as recyclable but are not supported by infrastructure and/or secondary markets in a specific location. It also occurs when materials are not accepted for recycling at a specific location.
- Materials must continuously be sorted regardless of available markets. The costs versus benefits of managing these sorted materials while waiting for new markets to emerge needs to be better articulated and understood.

Public awareness

- Limited awareness about the role of the commodities market in developing better recycling programs, creating industry connections, and educating customers is potentially contributing to the more than \$9 billion of lost revenue when valuable materials are disposed in landfills.
- Limited public awareness of the social and economic benefits of recycling is also contributing to the loss of revenue when these valuable materials are disposed of in landfills.

2019 Workgroup Priority Actions and Accomplishments

- The workgroup participants worked together to develop a series of consistent messages for key recycling issues as their top priority action. As an initial step, the workgroup compiled positive messages already in use by workgroup participants. Workgroup participants shared: 1) a quote from their organization leadership describing why recycling is important to them; 2) data that each organization has on the environmental impact of recycling; 3) data that each organization has on the economic impact of recycling; and 4) data on any material-specific recycling rates each organization might have.
- The group collected over twenty responses and evaluated them for any gaps in coverage across the recycling system. Using the collected messages, Keep America Beautiful, The Recycling Partnership, and the Sustainable Packaging Coalition developed an infographic highlighting positive messages about the U.S. recycling system. This infographic includes messages that: emphasize the strength of the recycling system; articulate the range of benefits of recycling to reinforce the importance of recycling; demonstrate recycled materials have value, are of good quality, and are not diminished because the materials had a prior life; and, emphasize the value of recyclables as commodities (rather than waste), including the value of sustainable materials management and life-cycle analysis.

America Recycles Network Actions and Accomplishments

- The Recycling Partnership announced the launch of DIYSigns, a free online resource that anyone can use to educate consumers on what can be recycled in their area. The tool helps anyone develop free customizable posters, labels and signs.
- The U.S. Chamber of Commerce Foundation, in coordination with the city of Cincinnati, Ohio, announced its Beyond 34: Recycling and Recovery for a New Economy Program would be expanded to Cincinnati. The initiative, piloted in Orlando, Florida, aims to develop educational materials to help a community of any size increase and improve recycling rates.
- The Can Manufacturers Institute and the National Association of Convenience Stores jointly published a report in April 2019 called *The Value of Can and Bottle Recycling*. The report offers guidance to convenience store retailers—focusing on those that sell motor fuel—on how and why to implement effective recycling programs at their stores. This guidance is important because beverage cans and plastic bottles account for one-third of the items littered outside a convenience store. Also, 70 percent of drivers say they dispose of all materials from their vehicles while refueling at the gas pump.

- A consortium of national can manufacturers—Anheuser-Busch, Ardagh Group, Ball Corporation, Can Manufacturers Institute, Crown Holdings, Novelis, and Tri-Arrows Aluminum—partnered with the City of Denver and The Recycling Partnership on an intensive effort to increase the collection of aluminum beverage cans across Denver. Results showed that Denver residents recycled significantly more aluminum beverage cans as a result of simplified messaging and communication with residents through tagging their carts. The Can Manufacturers Institute, The Recycling Partnership, and others are using the insights from this work to inform future efforts to effectively change behavior and promote the sustainability advantages of the can so that more cans are recycled.
- The National Waste and Recycling Association, in partnership with the Solid Waste Association of North America, the Northeast Recycling Council, and the Institute of Scrap Recycling Industries, developed a “Think Twice” poster to get people to pause and think in order to avoid adding contaminants to the recycling stream.
- To help identify and reduce contamination in residential recycling, the Colorado Department of Public Health and Environment (CDPHE)—with assistance from The Recycling Partnership—surveyed MRFs to identify the top contaminants recyclers are receiving. Using information from the survey, CDPHE identified 1) plastic bags and 2) food or liquid in recycling containers as the most problematic contaminants of the recycling stream. CDPHE then conducted a public outreach campaign (with graphics from The Recycling Partnership) that reached over 900,000 Colorado residents with the message that plastic bags and food- or liquid-containing materials should never be placed in the recycling bin.

EPA Actions

- Publish pledge signatory success stories and Veteran’s Stories to showcase the goals and accomplishments of America Recycles Pledge signatories as well as the veterans they employ.
- Publish WasteWise Partner success stories in honor of the program’s 25th Anniversary. The success stories will demonstrate the accomplishments and measurable results of organizations participating in WasteWise and provide examples of scalable recycling activities.
- Develop a pilot educational campaign to encourage recycling through retail/alternative collection programs, thus decreasing the amount of plastic film entering curbside collection programs. This will reduce contamination of the recycling stream, along with safety hazards that plastic bags can cause at materials recovery facilities.

Recommended 2020 Workgroup Actions Under Consideration

- Develop and make available a set of common recycling messages on nationally-significant issues (e.g. plastic film/bags), building off the efforts of workgroup participants.
- Evaluate the feasibility of a national public relations campaign to lay the foundation for common messaging on nationally-significant materials or issues. The campaign could be directed at engaging youth or other audiences.
- Share information about available free, open-source, downloadable labels for recycling bins.



Enhance Materials Management Infrastructure

America's existing recycling infrastructure has not kept pace with today's changing recyclables stream. Manufacturers of new materials and products may not always consider end-of-life management, which impacts the ability of the recycling industry to prepare for and optimally manage the recycling of collected materials. Contamination in the recyclables stream can cause equipment failures and halt production lines to allow for the removal of unwanted materials. The increased cost of processing, including safety issues combined with lower market prices, is leading to increased landfilling of recyclables, loss of revenue for jurisdictions, and decreased recycling rates. New investments in infrastructure are needed to help meet the nation's materials management needs and foster a more resilient solid waste system that is capable of withstanding pressures from disruptions.

Vision

A holistic, modern and adaptable national recycling infrastructure that embraces innovation and is resilient to changes in material streams, markets and consumer expectations.

Challenges

Workgroup participants identified three key challenges: resiliency; pricing; and localized differences in managing materials across the country.

Resiliency

- There is a lack of resilient recycling infrastructure that is nimble, adaptable and efficient.
- There is insufficient investment to improve, enhance and expand recycling infrastructure capacity and improve recycling technology.
- Communication among stakeholders across the manufacturing and recycling system value chain needs to be improved to allow for more flexible design and planning of recycling infrastructure investments to better handle today's evolving materials.
- Funding for innovative state, territorial, tribal, local and private sector pilot programs to promote innovation in recycling and materials management is not readily available.

Pricing

- In some parts of the country, recycling can be more expensive than landfilling, and recycled material can be expensive relative to virgin materials.
- Methods to reduce the cost of recycling and recycled materials relative to landfilling and virgin materials need to be identified and advanced to help recycled materials become more cost competitive.

Priority Action

Compile existing information on funding opportunities for infrastructure investments nation-wide.

Localized differences

- Different approaches to collecting and managing materials can pose challenges, especially for consumers. For example, differences in what can be collected and processed varies across the country, adding to consumer confusion about what can be recycled in their communities. This confusion can increase the contamination rate and negatively impacts local, regional and national markets for recycled materials.
- Differences in the materials accepted or collected within the same geographic area can result in lack of access to recycling for some communities.
- Research is needed to identify strategies to manage and/or address issues, such as contamination and collection rates, related to single-stream recycling.

2019 Workgroup Priority Actions and Accomplishments

- The workgroup steering committee, with input from workgroup participants, compiled a list of funding resources from both public and private organizations that will be housed on the virtual clearinghouse website. The virtual clearinghouse is further described in a later section of this *National Framework*.

America Recycles Network Actions and Accomplishments

- The Materials Recovery for the Future research program, in coordination with sixteen member companies, operated a pilot program to collect flexible film packaging from single-stream curbside recycling systems.
- The North Carolina Department of Environmental Quality is offering Regional Recycling Infrastructure grants to help areas develop or refurbish residential comingled recycling infrastructure.
- The New York State Department of Environmental Conservation is offering grants for Recycling Capital Projects. The grants can be used for construction of materials recycling facilities and purchase of equipment.
- The Reducing Embodied-Energy and Decreasing Emissions (REMADE) Institute has 31 public-private partnerships focused on reducing the cost of technologies needed to reuse, recycle and remanufacture materials.
- In September 2019, PepsiCo set a new target to reduce 35 percent of virgin plastic content across its beverage business by 2025, which equates to the elimination of 2.5 million metric tons of cumulative virgin plastic, taking into account business growth. To develop a more robust recycling infrastructure in the U.S. and around the world, PepsiCo and The PepsiCo Foundation pledged over \$51 million between July 2018 and July 2019 in partnership with organizations including The Recycling Partnership, Circulate Capital, and the Alliance to End Plastic Waste, among others. Additionally, PepsiCo is proud to support the American Beverage Association's Every Bottle Back initiative, a set of efforts aimed at reducing the industry's use of new plastic materials by investing \$100 million into a new industry fund to improve collection, sorting and processing of beverage bottles.

EPA Actions

- EPA will compile and build upon existing information to map recycling infrastructure that is currently available in this country to service millions of Americans' recycling needs. The map will help identify information or service gaps in collection and processing capabilities in the United States.

Recommended 2020 Workgroup Actions Under Consideration

- Conduct and compile research on successful infrastructure investments and potential investment opportunities.
- Continue support of the "Materials Recovery for the Future" pilot project, which launched in February 2019. Share results and outcomes of the "Materials Recovery for the Future" pilot project to assess potential for replication.
- Explore the creation of incentives to encourage investment in recycling or find existing tax incentives that organizations could leverage to help materials recovery facilities (MRFs) evolve to meet the challenges posed by the evolving materials stream.



Strengthen Secondary Materials Markets

Recent policy changes including international import restrictions have accelerated the need to improve domestic markets for recyclable materials and recyclable products, as well as to better integrate recycled materials and end-of-life management into product and packaging designs. The loss of available international markets for recyclable materials has impacted the economics of recycling both within the U.S. and worldwide. Encouraging communication and collaboration across the different sectors of the U.S. economy, including private enterprise and government entities, will support innovation as well as the development, manufacture and reuse of high-quality recyclable materials. A stronger domestic recycling market will support local communities by creating more jobs and providing the U.S. economy with greater resilience to market disruptions. Municipalities will achieve cost savings when the markets for recycled materials are improved and more robust.

Vision

High-quality recycled materials are produced that can be incorporated easily into products, driving demand and creating an integrated, robust and sustainable domestic recycling market.

Challenges

Workgroup participants identified two key challenges: supporting existing end-markets and developing new end-markets.

Supporting existing end-markets

- Improved dialogue is needed among MRFs, recyclers, product designers, governments, etc., to inform the design and production of new products, including packaging.
- Established end-markets and MRF technologies are not always being used with maximum effectiveness to identify recyclables that can be included in recycling programs.
- Contracts between municipalities and MRFs need to be restructured to better insulate them from market fluctuations.
- There is a need to increase dissemination of comprehensive information on commodity markets to MRFs.

Priority Action

Host market development workshops across the country.

Developing new end-markets

- Well-crafted policies to encourage robust recycling markets need to be created and implemented.
- Market-, technology-, and material-based incentives that encourage manufacturers to use post-consumer content in a wide range of product and packaging designs are needed.
- Environmentally preferential purchasing policies are being created and implemented; these policies should be identified, reviewed, developed and/or revised.
- There is a need to better highlight the value of recycling to stimulate investment.

2019 Workgroup Priority Actions and Accomplishments

- The National Recycling Coalition, in partnership with EPA, the State of Texas Alliance for Recycling and the California Resource Recovery Association, successfully hosted three market development workshops across the country. Each workshop featured information to spur regional markets for recycled materials including materials that are hard to recycle. An additional four workshops are planned for 2020.
- The workgroup agreed that there is a need to encourage businesses and governments to increase demand for recycled content materials by buying more items containing recycled content and/or incorporating more recycled content into products they manufacture.
- Workgroup participants also initiated activities to develop and release a market-development toolkit for governments, materials recovery facilities, and secondary processing facilities. The toolkit will include FAQs, guidance on how to conduct cost vs. benefit analysis for investments, incremental and major enhancements, planning for future materials, and contracting best practices to ensure the capability to meet current and future needs.

America Recycles Network Activities and Accomplishments

- The National Recycling Coalition, in partnership with More Recycling, is working to connect sellers of recycled/recyclable materials with potential buyers to create a virtual or web-based marketplace.
- The Association of Plastic Recyclers, in partnership with The Recycling Partnership, more than doubled the number of companies participating in its Demand Champion Program. Collectively the program has led to the use of over 6.8 million pounds of post-consumer resins.
- The Recycling Partnership, in partnership with industry experts, has developed a best practices document related to municipality/MRF processing contracts.
- Applying Systems Thinking to Recycling (ASTRX), The Recycling Partnership, and the Sustainable Packaging Coalition co-authored a report titled, *ASTRX Review of Material Flow at MRFs and Reprocessors*. The report provides information on the movement of materials through MRFs and can be used by organizations across the recycling system to improve materials recovery and support market development.

EPA Actions

- Develop options for an incentive-based voluntary program focused on increasing recycling as well as the demand for post-consumer recyclable materials. Such a program would help strengthen and increase domestic demand for post-consumer recyclable materials and serve as a stimulus in U.S. markets for materials collected through recycling programs, encourage sustainable management of collected materials, and mitigate reliance on export markets.

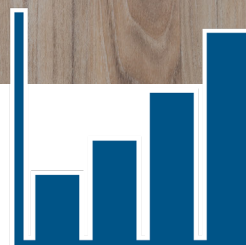
Recommended 2020 Workgroup Actions Under Consideration

- Continue to promote government programs to purchase recycled materials, such as EPA's Comprehensive Procurement Guidelines.
- Identify and work with companies designing packaging and products to encourage the use of recycled content and improved recyclability of goods.
- Explore economic models to create robust and sustainable domestic secondary markets, including possible incentives to drive demand and create more end users.
- Build and articulate a better business case for using recycled materials that identifies the full value proposition.



Enhance Measurement

Different definitions and recycling rate methodologies across the country create challenges to setting goals and tracking progress. Stakeholders across the recycling system agree that more consistent measurement methodologies are needed for waste management. Standardizing and aligning measurement, as well as tracking recyclable materials, will help better inform policy decisions and investments, and help determine whether progress is being made in improving recyclable materials management in the United States. It will also help promote cross-jurisdictional learning by providing more transparent and comparable data sets.



Vision

Establish standardized recycling metrics that are supported by consistent terminology and methodology.

Challenges

Workgroup participants identified two key challenges: new ways of measuring and the diversity/variety of measurement approaches.

New ways of measuring

- Varying measurement definitions can cause confusion and limit understanding of recycling system performance.
- Because different materials have different economic and environmental impacts, it is unclear if disposal of all materials should be considered equal.

Diversity and variety of measurements

- Consideration of only one metric does not adequately convey progress on sustainable materials management. Multiple variables and metrics must be considered simultaneously for a complete picture of progress.
- Few methodologies are available to classify some municipal solid waste management materials and activities (e.g., beneficial use of tires or abandoned vehicles).

Priority Action

Compile information on a range of metrics and measures, including definitions, what types of analyses these metrics and measures support, where in the recycling process these measures/metrics apply, data available, data gaps/needs, quality of data, and pros and cons of the various measures.

2019 Workgroup Priority Actions and Accomplishments

- The workgroup initiated the effort to compile information on a range of recycling metrics and measures for use by organizations across the recycling system, including definitions, the types

of analyses these metrics and measures support, where in the recycling process these measures/metrics apply, available data, data gaps/needs, quality of data, and pros and cons of the various measures. The workgroup compiled a list of published definitions of recycling from EPA and other publicly-available sources and used it as the basis for a draft definition of recycling. In addition to the development of a definition, the workgroup also developed a recycling system map showing the flow of materials through the system.

America Recycles Network Activities and Accomplishments

- For several years, the Can Manufacturers Institute and The Aluminum Association have jointly produced a sustainability key performance indicators report on the aluminum beverage can, focused on four key metrics: the industry recycling rate, the consumer recycling rate, the value per ton and recycled content. The goal of this annual reporting is to provide up-to-date, complete and accurate information on industry sustainability. The 2019 report details how the aluminum beverage can has again had superior results on each of these metrics compared to other beverage container materials.

EPA Actions

- Revise the 1997 document *Measuring Recycling: A Guide for State and Local Governments* to serve as a tool for states to help standardize reporting information, including separating residential and commercial streams.
- Update EPA's Recon Tool, which calculates greenhouse gas emissions reductions associated with recycled content material. This tool will provide data and information to the public about the environmental benefits associated with use of recycled content material.
- Work with other federal agencies and seek public input in establishing national recycling definitions and work with states to understand different methodologies for measuring diversion rates.
- Seek input from the America Recycles Network organizations and the public to establish national goals to increase recycling in 2020.
- Continue to facilitate EPA's State Data Measurement Sharing Program (SMP). The SMP provides a compilation of data, tools, and research to help improve participating organizations' internal/external processes and programs and expand the public dialogue on how materials management affects the environment. The SMP also helps promote the replication of successful recycling, reuse, and source reduction ideas and programs.

Recommended 2020 Workgroup Actions Under Consideration

- Use the workgroup definition of recycling and the recycling system diagram to create metrics for measuring recycling. The resulting metrics and associated data points will be transparent and allow governments and businesses to use comparable metrics and data for tracking their recycling rates.
- Provide input to develop additional draft definitions associated with materials flow through the system.
- Develop a central compilation of data and metrics used to measure recycling or components of the recycling system.
- Compile results of workgroup activities (definitions, material flow map, metrics, and measures) for integration into *Measuring Recycling: A Guide for State and Local Governments*.



Cross-Cutting Actions

The four critical action areas previously discussed are interconnected, with actions taken in all areas contributing to the system-wide change that is needed to build a stronger, more resilient recycling system. As the four America Recycles workgroup activities progressed over 2019, a few actions emerged as clearly supporting and advancing multiple action areas. These “cross-cutting” actions are summarized in this section.

2019 Workgroup Priority Actions and Accomplishments

- The Chamber of Commerce Foundation, in partnership with the U.S. EPA, the Institute of Scrap Recycling Industries, and Keep America Beautiful, is launching a publicly accessible, web-based portal that will serve as a “virtual clearinghouse” for recycling tools and resources. The clearinghouse will serve as a one-stop-shop virtual resource for information about recycling issues on a well-maintained, publicly available platform.

EPA Actions and Accomplishments

- Release *National Framework for Advancing the U.S. Recycling System* to articulate actions taken to-date and the recommended actions for 2020.
- Support the continued, sustained collaboration among the 165+ pledge signatories by continuing to facilitate workgroup meetings and dialogues, including hosting future meetings to implement and develop new actions within this *National Framework*.
- Conduct webinars and outreach on the virtual clearinghouse to increase resources/information included in the web-based tool.



Conclusion

This *National Framework for Advancing the U.S. Recycling System* is an initial step toward defining and addressing the complex challenges facing the U.S. recycling system. Over the course of 2018, EPA facilitated a series of workgroup meetings and dialogues with representatives from across the recycling system to identify the top challenges limiting recovery and reuse of materials commonly collected through recycling. Throughout this process, it was clear that no individual organization could address all the identified challenges independently. Sustained collaboration and coordination across the recycling system is essential to addressing the challenges. It will take a network of federal, state, local and tribal governments, manufacturers, brands, non-profit organizations, recycling industry associations, and waste management companies to truly shift the system. To assist these efforts, EPA will continue to serve in its unique role as a convener and facilitator of the America Recycles Network efforts.

The accomplishments listed in this *National Framework* summarize the work completed and planned as of November 2019. In addition to the activities underway by the workgroups, EPA recognizes that many organizations are working together to improve the resiliency of the U.S. recycling system. The activities highlighted in this *National Framework* are not intended to be a comprehensive list of work underway; rather, present a selection of activities that took place in 2019 and are planned in 2020 voluntarily provided by organizations within the America Recycles Network.

EPA recognizes that collective and collaborative commitments are best achieved when there are common goals. EPA is committed to continuing to provide a comprehensive national picture of the generation, management and final disposition of the municipal solid waste stream. In 2020, EPA will develop overarching national goals, with underlying indicators that describe the performance of different components of the recycling system, to inspire action and drive participation, innovation, and progress across the entire value chain, including consumers. The national goals and associated indicators will provide the benchmarks needed to measure the success of the collective efforts of the America Recycles Network as it continues to implement and expand the actions set forth in the *National Framework*. The goals also will inspire others to significantly improve the nation's recycling system so that the United States is able and prepared to address existing and future recycling challenges.



Appendix A: List of America Recycles Pledge Signatories

The following organizations signed the America Recycles Pledge during the America Recycles Day Summit on November 15, 2018.

2018 Pledge Signatories

1. The Aluminum Association
2. American Beverage Association
3. American Chemistry Council
4. American Forest & Paper Association
5. American Iron and Steel Institute
6. AMERIPEN
7. Association of Plastic Recyclers
8. Association of State and Territorial Solid Waste Management Officials
9. City of New York Department of Sanitation
10. Closed Loop Partners
11. The Coca-Cola Company
12. Colgate-Palmolive Company
13. Construction & Demolition Recycling Association
14. Danone North America
15. District of Columbia Department of Public Works
16. The Dow Chemical Company
17. Environmental Council of the States
18. Fairfax County, Virginia (on behalf of the National Association of Counties)
19. Ford Motor Company
20. General Mills
21. GreenBlue Institute
22. Institute of Scrap Recycling Industries
23. Keep America Beautiful
24. Keurig Dr Pepper
25. McDonald's
26. National Recycling Coalition
27. National Waste & Recycling Association
28. Nestle
29. Northeast Recycling Council, Inc.
30. Paper Recycling Coalition
31. PepsiCo
32. Plastics Industry Association
33. The Procter & Gamble Company
34. Puerto Rico Solid Waste Management Authority
35. Republic Services
36. The Recycling Partnership
37. Solid Waste Association of North America
38. Southeast Recycling Development Council
39. Target Corporation
40. U.S. Chamber of Commerce
41. U.S. Chamber of Commerce Foundation
42. U.S. Environmental Protection Agency
43. Unilever
44. Walmart Inc.
45. Waste Management Recycle America

2019 Pledge Signatories

The following organizations signed the America Recycles Pledge in 2019. Please note that the pledge signatories listed below are current as of November 8, 2019. For the most up-to-date list, please visit: <https://www.epa.gov/americanrecycles/forms/america-recycles-pledge>.

1. 8-hz
2. Allegany County, Maryland
3. Amazon
4. Ames Laboratory
5. Argonne National Laboratory
6. Arkansas Department of Energy and Environment, Division of Environmental Quality
7. Associated Recyclers of Wisconsin
8. Artist at Heart, LLC
9. Austin Rubber Company
10. Axion Structural Innovations LLC
11. Battery Council International
12. Berry Global
13. Cabka
14. Can Manufacturers Institute
15. Carilion Clinic
16. Carton Council of North America, Inc.
17. Cascadia Consulting Group
18. City of Boston, Massachusetts
19. City of Lebanon, New Hampshire
20. City of Phoenix, Arizona
21. City of San José Environmental Services Department
22. Civil Agents
23. Clackamas County, Oregon
24. Coalición de Reciclaje de Puerto Rico
25. Colorado Department of Public Health and Environment
26. Comanche Nation Environmental Program
27. Compology
28. Construction and Demolition Recycling, Inc.
29. Continuum Materials
30. County of Greenville, South Carolina
31. CTC Foundation
32. Curb My Clutter
33. Deer Valley Resort
34. Delaware River and Bay Authority
35. Delta Institute
36. Display Pack
37. Diverse Recycling Solutions, LLC
38. Donegan Elementary School (Bethlehem, Pennsylvania)
39. Don't Waste Durham
40. Dutton Polymer Group
41. EcoRich
42. EFS-plastics Inc.
43. End of Waste Foundation, Inc.
44. Environmental Packaging International - Lorax
45. Environmental Research and Education Foundation
46. ExxonMobil
47. Fabri-Kal Corp.
48. First Solar
49. Food Rescue
50. Foodservice Packaging Institute
51. Fort Peck Tribes Office of Environmental Protection
52. Fortune WEEE Solutions Inc.
53. General Motors
54. Glass Packaging Institute
55. Glass WRX SC
56. Global Co Lab Network
57. GO Box Reuse Systems
58. Green Minds Group
59. Hallotex
60. Healthy Communities of Brownsville, Texas
61. Igloo Products Corp.
62. Innovative Injection Technologies (i2-tech)
63. Interior Removal Specialist, Inc.
64. JRMA
65. Kansas City Church of the Ascension
66. Kathleen Stroud Global
67. Keep California Beautiful
68. Keep Thomas County Beautiful

69. Kheops International, Inc.
70. Li-Cycle
71. Machinex Technologies Inc.
72. MariMatic Oy
73. Massachusetts Department of Environmental Protection
74. Mattress Recycling Council
75. The Metropolitan Environmental Trust
76. mobius pbc
77. Monroe County, New York, Department of Environmental Services
78. Monterey Regional Waste Management District, California
79. Montgomery County Environmental Services, Ohio
80. More Recycling
81. MSW Consultants
82. National Association of Convenience Stores
83. National Association of Manufacturers
84. National Association of Regional Councils
85. National Center for Electronics Recycling
86. National League of Cities
87. Nevada Division of Environmental Protection
88. New York Department of Environmental Conservation
89. North Carolina Department of Environmental Quality
90. Oregon Department of Environmental Quality
91. Oxner Legha Law Firm
92. PakTech
93. PourAway
94. Professional Recyclers of Pennsylvania
95. Recology
96. Recycle Across America
97. Recycle Coach
98. RecycleGO
99. Recycling Rules
100. Recyclist
101. Refresh Glass, LLC
102. re:nü Waste Management
103. Repolytex, LLC
104. Republic Services
105. Revolution Plastics
106. Revolution Systems
107. Rubicon Global
108. Samsung Electronics America
109. SBK Recycle
110. SCRAPP
111. Shark Soutions
112. Sipayik Environmental Department (Perry, Maine)
113. Smithsonian Conservation Commons
114. Sonoran Studio Foundation
115. Sony Electronics Inc
116. South Carolina Department of Commerce
117. South Carolina Department of Health and Environmental Control
118. South Carolina Department of Labor, Licensing and Regulation
119. Specialty Graphics Imaging Association
120. Steel Manufacturers Association
121. Sunshine Recycling
122. Technologies International Corporation (TIC)
123. TCL North America
124. Think Zero LLC
125. Titus MRF Services
126. Upcyclers Network
127. U.S. Conference of Mayors
128. Verdex Technologies Inc.
129. Verizon
130. Vermont Department of Environmental Conservation
131. The Vinyl Institute
132. Washburn University
133. WasteCap Resource Solutions
134. Winters Bros.
135. Zhang and Company

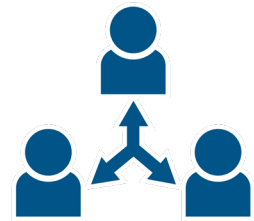


Appendix B: America Recycles Workgroup Participants

PROMOTING EDUCATION AND OUTREACH WORKGROUP

Steering Committee

- Keep America Beautiful
- The Recycling Partnership
- GreenBlue Institute



Workgroup Participants

- American Chemistry Council
- American Forestry & Paper Association
- Association of State and Territorial Solid Waste Management Officials
- Battery Council International
- California Resource Recovery Association
- Can Manufacturers Institute
- City of Cleveland, OH
- City of Phoenix, AZ
- City of Stillwater, OK
- Coca-Cola
- Colgate Palmolive
- Construction and Demolition Recycling Association
- DC Department of Public Works
- Dow Chemical Company
- ExxonMobil
- Foodservice Packaging Institute
- GreenBlue Institute
- Grocery Manufacturers Association
- Institute of Scrap Recycling Industries
- Keep America Beautiful
- Keurig Dr Pepper
- McDonald's
- National Association of County Officials
- National Waste and Recycling Association
- Paper Recycling Coalition
- PepsiCo
- Plastics Industry Association
- Solid Waste Association of North America
- The Aluminum Association
- The Recycling Partnership
- Tribal Waste and Response Steering Committee
- U.S. Environmental Protection Agency
- U.S. Chamber of Commerce Foundation
- U.S. Conference of Mayors
- Washington State Department of Ecology
- Waste Management

ENHANCING INFRASTRUCTURE WORKGROUP



Steering Committee

- US Chamber of Commerce Foundation
- Keep America Beautiful
- Institute of Scrap Recycling Industries

Workgroup Participants

- American Chemistry Council
- American Forest & Paper Association
- AMERIPEN
- Association of State and Territorial Waste Management Officials
- City of Cleveland, OH
- Construction and Demolition Recycling Association
- Danone North America
- DC Department of Public Works
- End of Waste
- Exxon Mobil
- Foodservice Packaging Institute
- GreenBlue Institute
- Institute of Scrap Recycling Industries
- Keep America Beautiful
- Keurig Dr Pepper
- National Association of Counties
- National Waste and Recycling Association
- Nestle USA
- Northeast Recycling Council
- New York City Department of Sanitation
- PepsiCo
- Plastics Industry Association
- Procter & Gamble
- SC Johnson
- Solid Waste Association of North America
- Southeast Recycling Development Council
- Steel Manufactures Association
- The Aluminum Association
- U.S. Chamber of Commerce
- U.S. Chamber of Commerce Foundation
- U.S. Conference of Mayors
- U.S. Environmental Protection Agency
- Waste Management

STRENGTHENING SECONDARY MATERIALS MARKETS WORKGROUP



Steering Committee

- The Recycling Partnership
- South Carolina Department of Commerce
- Waste Management

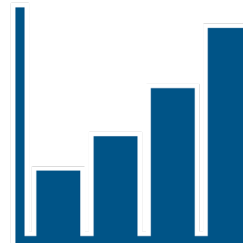
Workgroup Participants

- | | |
|--|---|
| <ul style="list-style-type: none"> • American Chemistry Council • American Forest & Paper Association • Association of State and Territorial Waste Management Officials • Battery Council International • Construction and Demolition Recycling Association • Danone North America • Exxon Mobil • Foodservice Packaging Institute • Ford Motor Company • GreenBlue Institute • Grocery Manufacturers Association • Institute of Scrap Recycling Industries • Keurig Dr Pepper • Lee County Public Utilities, FL • McDonald's | <ul style="list-style-type: none"> • MWWPR • National Association of Counties • National Recycling Coalition • National Waste and Recycling Association • New York City Department of Sanitation • Northeast Recycling Council • Plastics Industry Association • Rochester Institute of Technology - P2I • SC Johnson • South Carolina Department of Commerce • Steel Recycling Institute • The Aluminum Association • U.S. Chamber of Commerce • U.S. Conference of Mayors • U.S. Environmental Protection Agency • Waste Management |
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MEASUREMENT WORKGROUP

Steering Committee

- Environmental Research and Education Fund
- U.S. Environmental Protection Agency



Workgroup Participants

- American Chemistry Council
- American Forest & Paper Association
- American Beverage Association
- AMERIPEN
- Association of State and Territorial Solid Waste Management Officials
- California Resource Recovery Association
- City of Boulder, CO
- City of Phoenix, AZ
- Construction and Demolition Waste Recycling Association
- DC Department of Public Works
- End of Waste
- Environmental Research and Education Foundation
- General Mills
- GreenBlue Institute
- Institute of Scrap Recycling Industries
- Keep America Beautiful
- National Waste and Recycling Association
- New York City Department of Sanitation
- Oregon Department of Environmental Quality
- Plastics Industry Association
- Solid Waste Association of North America
- Southeast Recycling Development Council
- The Aluminum Association
- The Recycling Partnership
- U.S. Conference of Mayors
- U.S. Environmental Protection Agency
- Walmart
- Washington State Department of Ecology
- Waste Management

