



Toward a zero waste future

With the world's population expected to reach 9 billion people by 2050, the global waste problem is expected to grow as well, unless we change course. The World Bank estimated that the world produced 3.5 million tons of solid waste per day in 2010, and that amount is projected to double by 2025. That's not simply a lot of trash, it's a lot of lost value – as much as \$2.6 trillion annually in raw materials and residual worth. Landfill waste is a double loss: wasted product, and wasted natural resources to produce the product in the first place. The world can't afford to use up water, forests, food, minerals, fossil fuels or any natural resource in this way.

At Walmart, we've been attempting to reduce waste in our operations because we hate waste of any kind. Waste increases costs for our customers, our business and for society. As millions of tons of food, other products and packaging flow through

our facilities every year, we aim not to generate any waste in the process of getting things to customers. And if we can't sell a product, we don't want it to wind up in a waste stream; we'd prefer to donate it, recycle it or reuse it in some way. To date, we have made good progress – by the end of 2015, Walmart U.S. achieved 82 percent diversion of materials from landfill and diverted an average of 71 percent in international markets.*

As we have learned more about reducing waste in our own operations, we have embraced the concept of a "circular economy," which moves away from a "take-make-dispose" approach to one where products, their biological residue or component parts, are cycled back into the economic stream. A circular economy values the reuse and regeneration of materials and energy, and it encourages product design and handling that minimizes total environmental impact across the life cycle.



Operations



Packaging and products



Recycling education and infrastructure

*Based on review of material handling and waste diversion processes in the U.S., U.K., Chile, Central America, South Africa, Japan, Mexico, Canada, Brazil and Argentina, as reported by waste vendors, food banks and stores. In cases where real numbers were not available due to industry challenges, they have been estimated based on industry-acceptable standards.

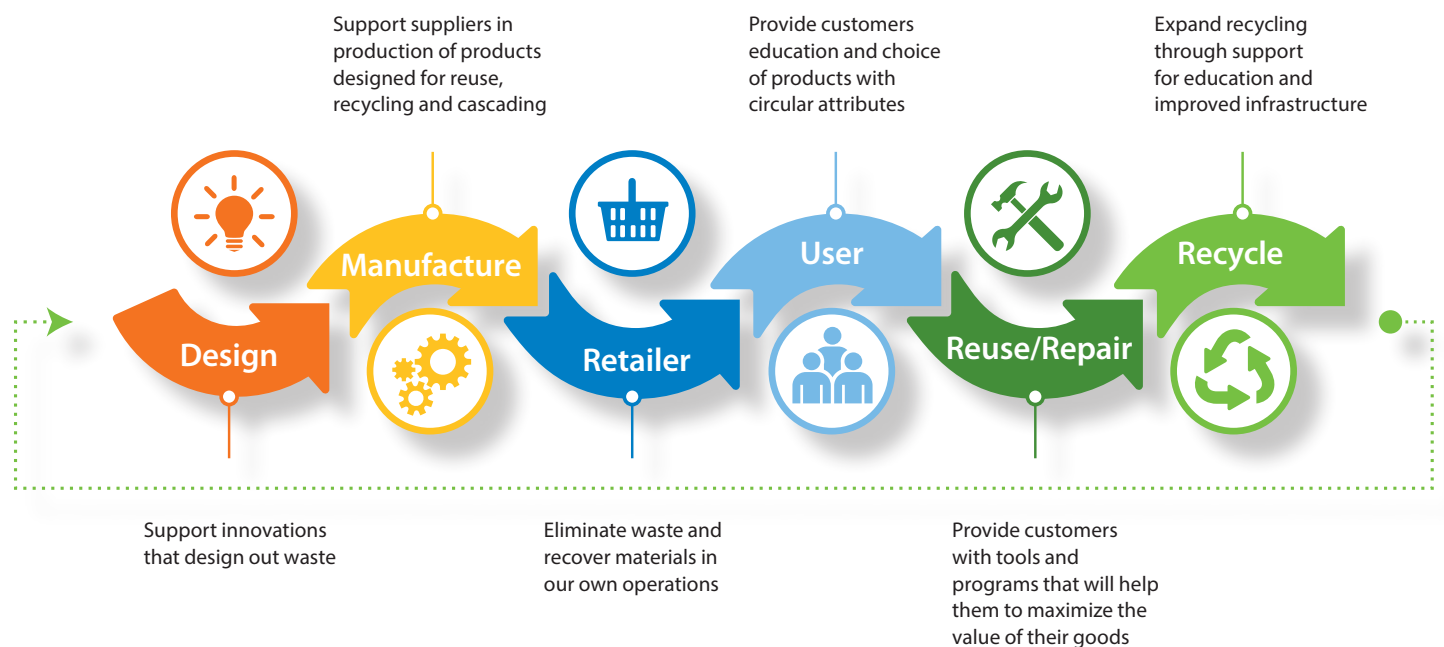
Accordingly, we have extended our zero waste aspiration to include the whole supply chain, from farming and manufacturing, consumption to end of life. Working with suppliers, customers, nonprofit organizations and others, we're drawing on our strengths – such as our store and logistics infrastructure, our philanthropy and our connection to customers – to pursue practical initiatives that will start to build a more circular economy. To this end, we're asking suppliers to design products with more recycled content, and with reuse and recyclability in mind. We're returning waste materials to the production stream by taking back certain products from customers and helping suppliers convert waste. We're also collaborating with suppliers and the Walmart Foundation to encourage communities to invest in recycling infrastructure through the Closed Loop Fund and other initiatives.

Moving toward a zero waste future benefits business as well as society. Eliminating operational waste avoids landfill fees and increases revenue from resale of salvaged materials. Reducing waste upstream, increasing recycled content and repurposing products can lower cost of goods and generate innovative products for customers. And in the long term, the preservation of natural resources enhances supply security.

In the following section, we describe our progress on three main strategies to move toward a zero waste future:

- **Eliminating waste in our own operations**
- **Promoting improvement in package and product design**
- **Expanding recycling through support for education and improved infrastructure**

How Walmart supports a circular economy



Zero waste – waste



Toward a zero waste future: Progress against commitments

As of Fiscal Year End 2016

Initiative	Commitment	Progress
Eliminating waste in our own operations	Create zero waste across our global operations.	Diverted from landfills 82 percent of materials previously considered waste from Walmart U.S., and an average 71 percent from Walmart International.*
	Reduce food waste in our emerging market stores and clubs by 15% and in other markets by 10% by December 31, 2015 (versus 2009 baseline).	Reduced food waste in our emerging market stores and clubs by 15.3 percent (versus 2009 baseline); Although progress was made in Japan, the U.K. and the U.S., we did not meet the overall goal for other markets.

At the end of 2015, Walmart U.S. diverted from landfills 82 percent of materials previously considered waste, with Walmart International diverting an average 71 percent.*



In 2009, Walmart and Sam’s Club U.S. launched a first-of-its-kind organics recycling program nationwide. As of 2015, the equivalent of more than 25,000 tractor-trailers full of food waste has been diverted out of the waste stream through composting, conversion to animal feed and energy production through anaerobic digestion.

Eliminating waste in our own operations

As we drive toward our zero waste goal, the first step is to reduce the amount of waste in the system. In our operations, we do this through a combination of diverting and repurposing materials, measuring waste and reducing food waste.

Diverting and repurposing materials

Globally, we recycle nearly 3 million tons of fiber and plastics annually. For our customers, we’re increasing the number of trade-in programs we offer for hard-to-recycle items like smartphones, tablets and video games. Thus far, we’ve collected more than 100,000 mobile phones and tablets through our U.S. store

trade-in program. We also provide diversion options for customers in Chile and Brazil. In South Africa more than 143 tons of post-consumer e-waste was diverted in 2015 through a collaboration with electronics companies Samsung and DESCO.

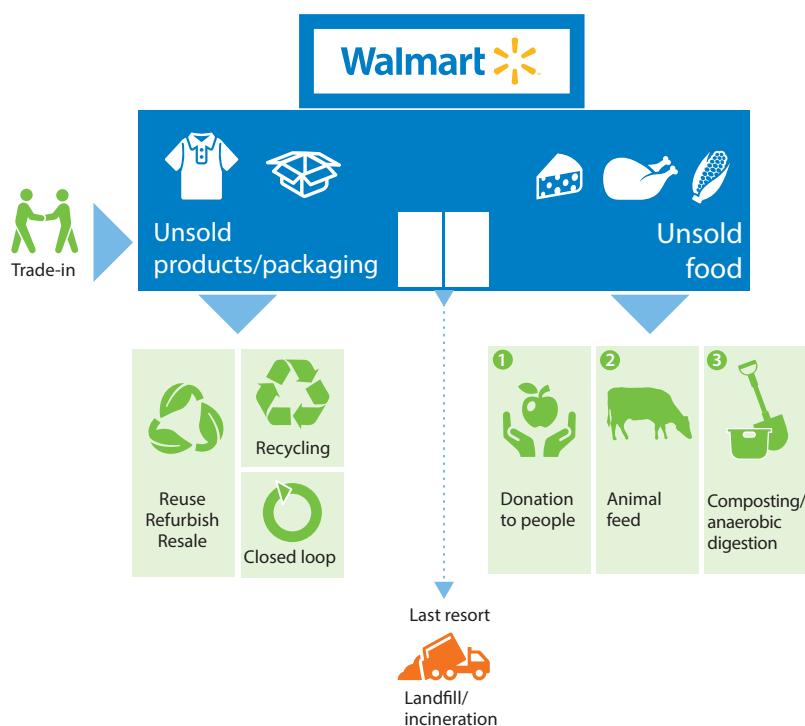
We are exploring additional ways we can work together with manufacturers, recyclers and other retailers to support solutions that will easily allow customers to recycle used products, with the goal of eventually being able to resell, donate or repair them.

As we pursue our zero waste goal, Walmart looks for ways we can help “close the loop” – bringing waste materials back into the production stream, working with suppliers to create new products.

For example, in the U.S., in collaboration with Metrolina, we have launched a program that encourages our customers to bring used floral containers and trays into Walmart Garden Centers. Metrolina picks them up and recycles them, repurposing the recycled materials into new floral pots for Walmart. After a successful pilot in 2013, the program expanded in 2014 and 2015 to now include 732 stores. This year, we received more than 1.4 million pounds of plastic containers and trays, which Metrolina can use to create the equivalent of 500,000 pots.

*Based on review of material handling and waste diversion processes in the U.S., U.K., Chile, Central America, South Africa, Japan, Mexico, Canada, Brazil and Argentina, as reported by waste vendors, food banks and stores. In cases where real numbers were not available due to industry challenges they have been estimated based on industry acceptable standards.

Current waste flows at Walmart



Ecoscraps®: From food waste to garden growth

Measuring waste

Pursuing zero waste in our operations requires that we work collaboratively with hundreds of waste vendors at the national and local levels around the world. Given the fragmentation of the waste and recycling industry, efficiently coordinating with vendors and obtaining reliable data is paramount. To address this, in 2015 we began a rollout of a global integrated data

management system. This platform will allow our waste vendors to submit information directly to Walmart, and it provides us with a tool for quality control, identification of discrepancies in data and performance management. When the system is fully implemented, every market and store manager will be able to view and receive actionable data on their recycling and donation performance. Over

time, this platform will allow our waste vendors to track their performance monthly and annually, as well as identify areas for improvement and potential innovation.

In 2015, Walmart began selling garden products from Ecoscraps®, a company that turns food scraps into organic and sustainable lawn materials such as compost, potting mixes and plant foods. Our sales of these products to date amount to more than 2.4 million pounds of food waste diverted from landfills. Ecoscraps® are made in part with food waste recycled from Walmart and enrich the soil, helping our customers grow healthier plants in a more sustainable way.

Zero waste – food



Consumers and food waste

The Walmart Foundation is also exploring ways to encourage consumers to reduce their own food waste. For example, through a grant of nearly \$375,000 to the nonprofit organization Global Green, we’re supporting the study of the factors that motivate residents of multi-family dwellings to participate in food scrap recovery.

Reducing food waste

As the world’s largest grocer, we are especially concerned with reducing food waste. According to the United Nations, approximately one third of global food is wasted from production to consumption each year. That equates to roughly \$1 trillion annually in wasted food value. In the U.S. alone, the Natural Resources Defense Council estimates that consumers waste almost 2 million metric tons of food every year. That’s equal to the weight of 500,000 commercial airplanes. All this waste poses a risk to the world’s ability to feed a growing global population. According to the World Economic Forum, the world

will need 60 percent more food by 2050 to feed a growing population. As a result, Walmart is working to prevent food from entering the waste stream at all and to donate food that isn’t sold to its highest and best use. When food can’t be donated, we’re redirecting it according to the U.S. Environmental Protection Agency’s Food Recovery Hierarchy by turning it into animal feed, recovering it as energy through anaerobic digestion or composting it.

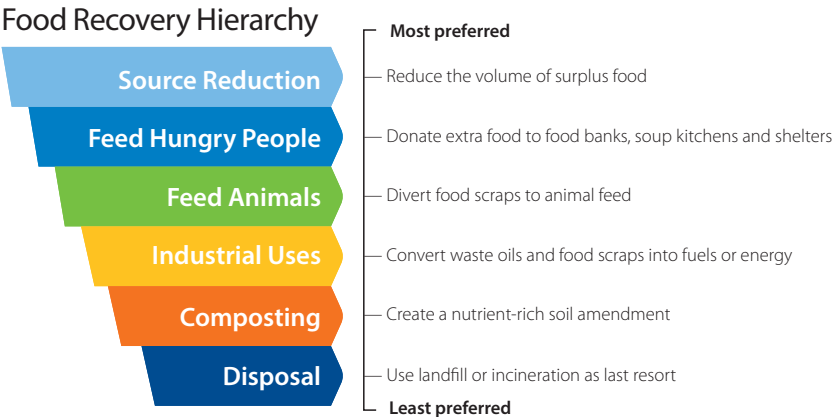
In 2010, we set a goal to reduce food waste in our emerging market stores – located in Argentina, Brazil, Central America, Chile and Mexico – by 15 percent by 2015 in comparison with our 2009

baseline. We’re happy to report we achieved this target, with a reduction of 15.3 percent. For this specific goal we limited categories to meat, produce and bakery and defined food waste as food that wasn’t sold to our customers or donated for human consumption.

For stores in developed markets – located in Canada, Japan, the U.K. and the U.S. – we set a goal of a 10 percent reduction. While we made progress, we have not fully reached this goal in all markets. In the U.K., food waste reduction programs have been established for a number of years, and the biggest opportunities for reduction have already been realized. In the U.S. and Canada,

Recovering food: A hierarchy of priorities

The U.S. Environmental Protection Agency (EPA) created the Food Recovery Hierarchy to help organizations prioritize steps they can take to prevent waste and divert unused food. Each tier of the Food Recovery Hierarchy focuses on different management strategies. The top levels of the hierarchy generate the most benefits for the environment, society and the economy. Walmart uses this hierarchy as a guide in our efforts to put food that might otherwise go to a landfill to its highest and best use.



our emphasis on providing fresh and affordable food to our customers meant that we unintentionally increased our food waste by rigorously discarding food that was bruised or damaged in the handling process.

Going forward, we will continue to pursue our targets in food waste reduction. As we move ahead, we will

implement what we've learned in the past five years: how important it is to build a culture focused on waste reduction, to enlist the support of store leadership and to have a standardized way of measuring waste reduction across our entire organization. We're also developing an end-to-end perspective on the value chain to determine the point where food waste occurs, either in

production and packaging, through ordering or distribution or during handling in the stores. This allows us to address problems in systemic ways and close the gaps at every stage as necessary. It will also enable us to continue reducing waste without compromising our commitment to delivering fresh food to customers.

Lessons learned in reducing food waste

Walmart's efforts to reduce food waste have taught us some important lessons along the way.

Promote an organizational culture that is anti-waste. Our Asda business in the U.K. internally adopted a "We hate waste" culture and widely promoted it across the organization. Merchandising and operations teams set up food waste reduction objectives that were tracked and rewarded when progress was made. Every store now does a "waste parade" at the end of the work day, where department managers present food which needs to be discarded to store managers. They discuss what happened and suggest alternatives to prevent waste going forward. Trading, supply chain and operational teams also have food waste reduction goals that are

now tracked on a daily basis. These measures have helped Asda keep its food throwaway rate at the very low level of less than 1 percent in the last five years.

Use associate knowledge to change internal processes. In the U.S., Walmart store managers brought to our attention that a large volume of perfectly good eggs was placed in the organics bin because we had to throw the whole carton away when a single egg was broken. In response, Walmart's operations and merchandising teams crafted two simple solutions. First, they worked on a ruggedized, shelf-ready, reusable plastic container to transport and merchandise the eggs, which reduced in-transit damage. Then, we worked to introduce a process to consolidate egg lots in stores

and provide our associates a simple, safe means of removing only the broken eggs and consolidating the undamaged product into whole cartons. As a result, this year we prevented 37 million eggs from being thrown out.

Provide consistent measurement and tracking tools. Wal-Mart de México introduced a food waste scorecard that allowed consistent measurement and tracking of progress across the organization. Each store has a food waste reduction goal, and they monitor daily performance with this scorecard. Using this information, they have formed a cross-department committee that has introduced a series of reduction solutions that have improved the monitoring of refrigerated products during deliveries, as well as overall logistics; helped with adjustments

to orders; and increased the engagement of store employees.

Work proactively upstream in the supply chain. As we have tried to increase our offering of fresh food to customers, we've learned there is more for us to do in working with our suppliers proactively. We were primarily focused on preventing waste once food reached our stores, when there are interventions we can make earlier in the distribution process. We believe this is an opportunity for us to reduce food waste in the future, by working on solutions that consider the whole process of distribution from harvest to purchase.

Zero waste – products and materials and packaging



Improving packaging and product design

As we work to eliminate waste in our operations, we also know that, as a retailer, we have the opportunity to engage with suppliers and manufacturers to encourage them to “design waste out” of the products sold in our stores and online. While the primary responsibility to create sustainable products rests with our suppliers, we don’t want our customers to have to choose between affordability and sustainability when they purchase from us. Building on our implementation of the Sustainability Index with our suppliers (see pg. 56), we are engaging with suppliers to:

- Design products for end of life
- Optimize packaging
- Increase the use and availability of recycled content

Designing for end of life

As waste continues to grow globally, it's becoming more important to design products at the outset with their end in mind. This allows important materials to be recycled back into the value stream. While Walmart is not ultimately responsible for the design of the products we sell, we are actively encouraging our suppliers, through the use

of the Sustainability Index, to factor reuse and recycling possibilities into their designs.

Some waste streams, such as electronic waste, present particular challenges. As the number of electronic devices sold every year increases with consumer demand, there is a corresponding need to keep such products out of landfills. These products often include toxic materials, like metals, that require special handling and could be reused if recycled properly.

That’s where designing products with the end in mind is critical. For example, Samsung recently launched a television that is easier to disassemble at the end of its life, which was awarded ISRI’s Design for Recycling® Award. The television utilizes snap-together parts that eliminate the use of many screws. The result is a product that’s easier to disassemble, recover, and recycle at the end – a fitting example of the circular economy at work.

Optimized packaging

Let’s face it – packaging is a hassle. Unwieldy boxes, difficult-to-open plastic clamshells, overflowing bubble wrap: Once packaging is opened at home, it can be challenging to determine what to do with the materials needed to protect a product

during transit. At the same time, packaging has an important function in preserving and protecting products and providing information to customers about the product itself.

While we’ve made significant progress with our suppliers in optimizing packaging, we still have work to do. Now that we have packaging key performance indicators (KPIs) in our Sustainability Index, we can better measure and track progress toward more sustainable packaging design and end of life initiatives. We’ve also been working with customers to better understand their expectations of, and challenges around, packaging.

Increasing the use and supply of recycled content

We’re also working with our suppliers to help them incorporate more recycled content into their packaging materials. In 2014, we surveyed nearly 100 Walmart suppliers about their current and future use of various types of post-consumer recycled (PCR) plastic. In 2015, we used the Index to collect PCR content data for a range of material types. More than 1,200 brand manufacturers across 28 product categories responded, and we determined an average of 23 percent of store shelf packaging contained PCR content.

Walmart recycled content in packaging by product sector

The Sustainability Index includes questions for suppliers that track their performance in key indicators. The following chart shows the results from the suppliers that participated in the Sustainability

Index to the question, “What percent of sales packaging has post-consumer recycled content, sustainable sourced renewable content or recyclable content?”

Sector	Percent of post-consumer recycled content
Electronics	27
Food, beverage and agriculture	25
General merchandise	29
Home and personal care	14
Toys	40

* Does not reflect all products on Walmart shelves

The soft side of packaging

Clothing and shoes – which come in all shapes and sizes – present a particular challenge when it comes to using the right amount of packaging. Too much packaging creates unnecessary waste, while too little can fail to appropriately protect a product during transit and in stores. In our footwear and apparel business, we've started to address this dilemma in two ways.

First, we've created a tool to optimize the size of corrugated cardboard shipping cartons for our

apparel orders, which is available to our buyers, replenishment and sourcing teams. Through using this tool, we reduced the overall number of boxes we ship by 8.1 million compared with FY2015, while also saving nearly 6.3 million pounds of corrugate, preventing more than 7,800 MT of greenhouse gases and eliminating \$15.3 million in operational costs.

Additionally, we've looked for areas where we can reduce packaging or remove it altogether – as we've

done in our footwear business. Since 2013, we've transitioned 85 million pairs of shoes from boxes to hangers. This reduces the overall packaging while taking up less space. The results have been clear: Better space utilization, with 16 million pounds of corrugate saved; more than 20,000 MT of greenhouse gases eliminated; and \$9 million in associated cost savings.



The path to optimized packaging: Asda's "Packaging Den"

Finding the right kind of packaging requires a balance of customer and environmental needs. In our Asda stores in the U.K., some ready-to-cook poultry meals were receiving a high number of complaints because the type of packaging used emitted an odor upon opening.

We took our customers' feedback into our packaging innovation lab – the "Packaging Den" – to come up with a solution. Drawing from previous success with a plastic film that could go directly into the oven, we worked collaboratively with our packaging supplier to create a new pack where the customer only has to pierce the film, eliminating any odors and the need to handle raw chicken. The package cooks directly in the oven and then can be recycled after use.



Transforming bottles into apparel labels

In 2015, we worked with our supplier Avery Dennison, a global packaging company, to find a more sustainable option for the fabric labels in our private label apparel lines. This collaboration resulted in transitioning our No Boundaries and Secret Treasures apparel to use 100 percent recycled content labels, which are derived from plastic bottles recycled into PET polyester. During the year, this initiative transitioned 80 million

labels toward lower impact versions. One of the label changes for our No Boundaries line eliminated 29 million cotton-dyed fabric endfold labels and implemented new recycled content labels that use 100 percent less water and 32 percent less energy, emit 39 percent less greenhouse gases and create 98 percent less solid waste than the old label.

Zero waste – packaging and recycling



The Closed Loop Fund: Investing in recycling infrastructure

Created in 2014 by Walmart and the Walmart Foundation with a coalition of 11 other corporate and foundation partners, the Closed Loop Fund (CLF) aims to invest \$100 million over five years to boost the amount of recycled materials available for manufacturing and to redirect food waste to beneficial purposes. Through no-interest and below-market interest loans to municipalities and private companies, CLF funds projects to improve local recycling infrastructure and boost recycling rates, thereby increasing the value that can be recovered through recycling and returned to the production stream.

In 2015, CLF closed its first round of funding with an initial capital investment of \$7.8 million, which led to an additional investment of \$17 million to support three projects: a plastics recovery facility in Baltimore, Md., plus municipal recycling conversions from dual to single stream in Quad Cities, Iowa, and Portage County, Ohio.

Expanding recycling through education and improved infrastructure

We're also helping to guide our customers through the complicated terrain of recycling and make it easier to recycle through facilitating improvements in recycling infrastructure. In 2015, Walmart U.S. joined Green Blue's Sustainable Packaging Coalition's How2Recycle™ label program. These standardized packaging labels provide consistent and transparent

information to customers regarding what can – and can't – be recycled. The labels also offer an opportunity to generate local conversation about why a particular item may not be recyclable, or why it's only recyclable in certain areas. We're working with our suppliers to incorporate these labels on Walmart and Sam's Club private label packaging and encouraging national brand suppliers to consider using the label as well.

This year we worked on using the label with Georgia-Pacific – one of the world's leading manufacturers and distributors

of pulp and paper products – ranked as a Sustainability Leader based on their scores in the 2015 Sustainability Index. As one of a few select suppliers, Georgia-Pacific volunteered to pilot with Walmart in the use of the How2Recycle label on Walmart and Sam's Club private label packaging. The pilot has resulted in the development of internal processes and guidance documentation to help future suppliers use the label, as well as recycling communication for our customers. Walmart plans to expand the use of the How2Recycle label across more of its private label products in 2016.

WIDELY RECYCLED At least 60% of the U.S. population can recycle this package type at curbside or municipal drop-off locations.	LIMITED RECYCLING Between 20-60% of the U.S. population can recycle this package type at curbside or municipal drop-off locations. Check your local program. *Not recycled in all communities	NOT YET RECYCLED Less than 20% of the U.S. population can recycle this package type OR includes a known contaminant to common recycling systems.	STORE DROP-OFF Polyethylene bags and films are widely recycled at store collection points, including grocery and other retail stores. Check for participating locations.

Expanding recycling

In a collaboration with Coca-Cola, Walmart Argentina launched the "Optimism that Transforms" program, which aims at increasing the recovery and recycling of PET. The program encourages the community to

separate PET packages in their homes and bring them to recycling stations available at Walmart stores. In 2015, more than 100,000 kilograms of PET were collected for recycling.



Notes from the field: Challenges in the pursuit of zero waste

Economic volatility

Over the past two years, a drop in commodity prices severely hampered the worldwide market for recyclables. That drop caused many suppliers to turn to less expensive virgin materials, decreasing the demand for recycled feedstocks.

Quality of materials

The quality of recycled materials is often variable, due to mixing of different types of materials and potential contaminants in the recycling stream. This can affect both price and availability of recycled materials. When it comes to packaging, optimization often requires balancing the type of materials used to protect a product against the potential damages to that product. This might be adding more packaging to protect the product or in the

short term, using nonrecyclable materials while working for longer-term recyclable options.

Long-term thinking

There may be short-term tradeoffs and necessary innovations needed for long-term successes. For example, keeping food fresher for longer might require using a nonrecyclable package in the short term. With a longer-term view, we are striving for innovative packaging and waste systems that will improve both recyclability and food preservation.

Industry and policy fragmentation

Significant fragmentation exists in the recycling industry and its global infrastructure. Even when sufficient demand for a recycled commodity exists, the distribution of those recycled

commodities to buyers can be unpredictable. Public policies regarding recycling protocols and materials recovery around the world are also far from unified, and lack of consensus on and use of industry labels can leave customers often confused about what can – and can't – be recycled. Additionally, the recycling industry lags in technological innovation and data gathering, which could be used to provide more accurate, targeted assessments and solutions at the local level.