



Recycling Update:
The current state of
recycling markets
and issues affecting
U.S. MRFs.

May 2019

Overview and Review of Major Issues

- **China.** Frequent topic of discussion. How does China affect us? We'll review the major historical state(s), evolution, and updated current conditions.
- **Contamination.** Programs subsidized by commodity sales let this issue grow—but most areas are at historic levels independent of subsidies and the situation worsens with increased variation of packaging types, increase in single serving packing, and increase of “wishcycling”.
- **Changes in end markets.** Changes in the markets are outpacing the development timeline of corresponding end market adjustments.
- **Global trade policy.** U.S. trade policy is not specifically aimed at recycling and commodity sales, but the ancillary effects are currently tearing through the recycling markets.
- **Public action and communication.** Most recyclers (aside from scrap metal) are at least two degrees of separation away from the generator (*i.e.*, YOU!). What can be done as an individual customer or as a municipal customer?

The “What and Why” of China’s Import Policies

- **Global economy.** Over the past 20 years, China had become the primary market for recyclables from across the globe. By 2017, over 30% of recyclables from the US were exported to China and almost 30% from across the globe - including over 50% of the world’s recycled paper and plastics.
- **A match made in heaven.** As their economy grew, they shipped finished goods and products to the U.S. and other countries, and we filled the containers with recycled material to ship back to China for manufacture into new products and packaging.
- **Development of an infrastructure – with few environmental controls.** 100’s of labor intensive mills across the country with little environmental controls.
- **China’s economic growth has slowed and wages are increasing.** Exports make up less of their GDP as their middle class grows.
- **Residents are using social media to demand clean air and water.**

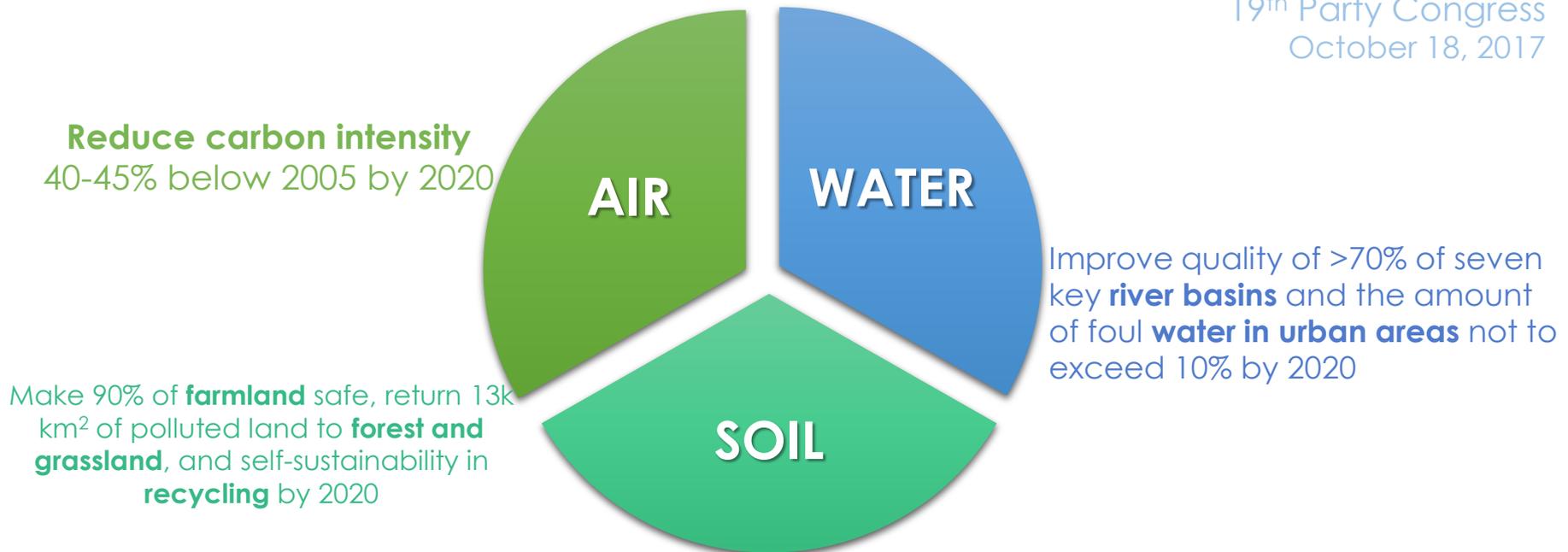
As President Xi has consolidated power, he is using policy/economic levers to improve their environment.

China's Environmental Challenge

"The modernization that we pursue is one characterized by harmonious co-existence between man and nature...We will launch initiatives to make the party and government offices do better when it comes to conservation, and develop eco-friendly families, schools, communities and transport services."

Xi Jinping

19th Party Congress
October 18, 2017

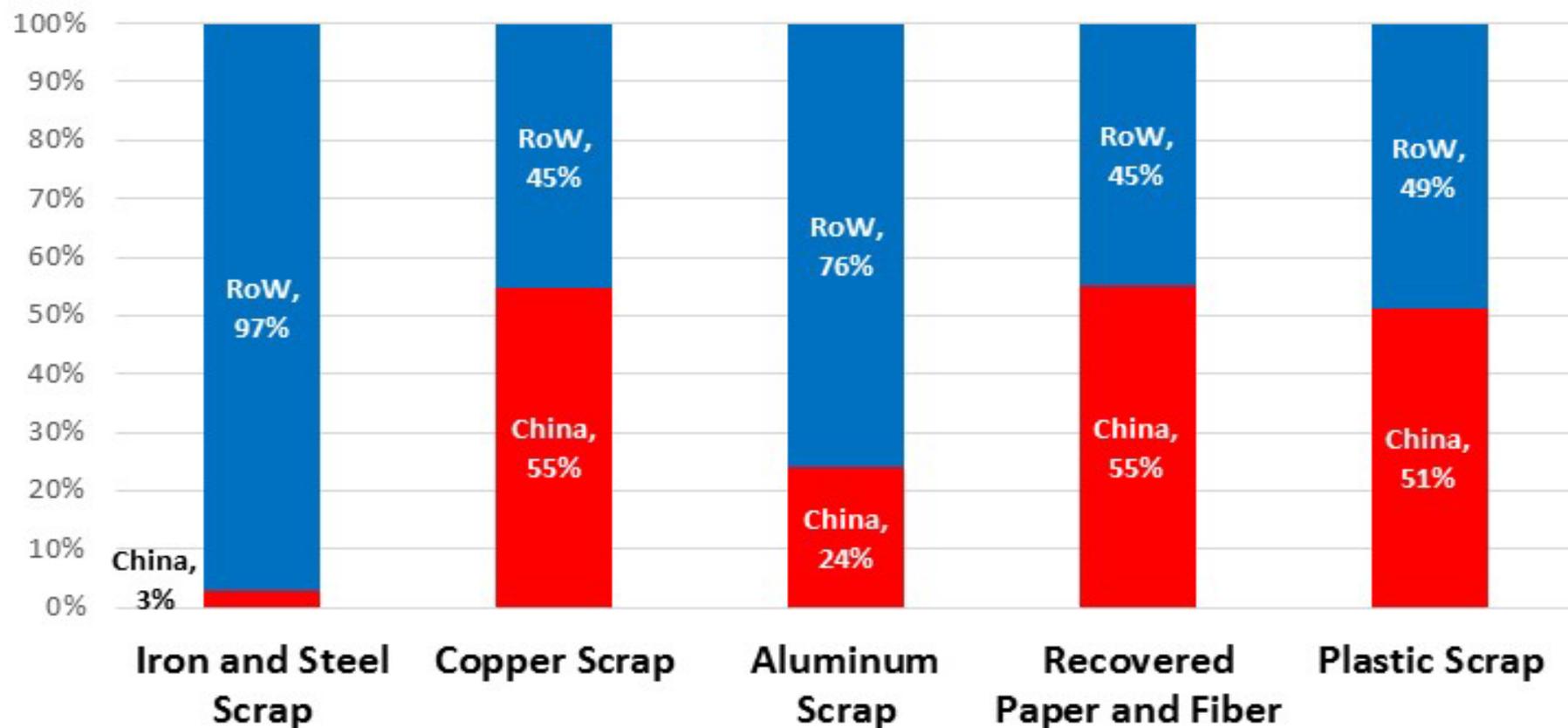


Source: Ministry of Environmental Protection of the People's Republic of China

Why “China Effect” Was So Large

Mainland China's Share of Global Imports for Selected Recycled Commodities, 2016(p)

Source: UN Comtrade Database



Changes to China's import policies

Beginning with **Operation Green Fence in 2013**, China began to increase its scrutiny on the quality of material imported into the country.

In mid-2017, the Chinese government began to implement a series of actions to reduce the volume and increase the quality of the imports to improve their air and water quality:

Ban of all Mixed Paper and Mixed Plastics

The Ministry of Environmental Protection of the People's Republic of China (MEP) informed the [World Trade Organization](#) (WTO) on July 18th of its intention to ban the import of 24 recyclable commodities, including "unsorted mixed paper" and "mixed plastics" effective January 1, 2018.

Suspension of all New License Approvals

The Chinese Ministry of the Environment (MEP) began limiting the flow of material last May by restricting the issuance of required import licenses to mills. We expect ongoing volatility in the approval of import licenses in 2018.

Reduction of Contamination Threshold to 0.5%

On January 11, 2018, China finalized its contamination standard limiting contamination for any material imported into the country to less than 0.5%.

Contamination reduction is the only lever that recyclers have to mitigate the impacts of China's new policies

The Quality Story (What Does a Hippo Weigh?)

Most commodities have historically had a purity standard or contamination allowance of 5%. This doesn't mean 5% can be *trash*, but no more than 5% can be anything but the intended commodity. That 5% must still be similar material...*e.g.*, newspaper or chipboard in cardboard, or cardboard in newspaper, etc. These are “outthrows”.

That means in a 2000 pound / one ton bale, i.e. the weight of a Hippopotamus, only the weight of a bloodhound can be outthrows.

Of that 5%, only 2% could be dissimilar material, including trash and plastics in fiber, or trash and fiber in plastics/metal. That's 40 pounds, or the weight of an average border collie. These are “prohibitives”.

Currently, most standards are 2% for outthrows (metal is <1%), but are 0.5% for prohibitives. That means in a 2000 pound bale, there must be less prohibitives than the weight of a Chihuahua, or 10 pounds.

Hippo vs Bloodhound vs Border Collie vs Chihuahua

For a human weighing 150 pounds, that's the weight of a very fat hamster.

For your average 96-gallon cart, that's 21 small French fries/half the size of your fist. Do you have more non-recyclables than that in your cart?

Fun Fact: Hippos have the widest mouth of any land animal – 2 ft.



Situation as of October 2018

- **China continued to limit inbound material:**
 - ✓ Outright ban of recyclables in May 2018; slow to resume
 - ✓ What is allowed, albeit much less than before, is now subject to trade tariffs, affecting sales prices.
- **The industry continues to move commodities, although at lower prices and to a broad variety of customers across the globe:**
 - ✓ Primary goal is to move material – avoiding landfilling and warehousing. Some states have granted waivers to a few companies
 - ✓ Processing costs have increased while prices have decreased
 - ✓ Plastic is moving to domestic buyers
 - ✓ Paper is moving to domestic mills, India, SE Asia, and South Korea.
 - ✓ Mills in China are buying some grades of paper - primarily double sorted cardboard (while this helps the overall business, it is not applicable for residential or commercial cardboard)

Situation as of October 2018

- **China continued to limit inbound material:**
 - ✓ Outright ban of recyclables in May 2018; slow to resume
 - Exports have not increased since October 2018.
 - ✓ What is allowed, albeit much less than before, is now subject to trade tariffs, affecting sales prices.
 - Still an issue, price continues to decline.
- **The industry continues to move commodities, although at lower prices and to a broad variety of customers across the globe:**
 - ✓ Primary goal is to move material – avoiding landfilling and warehousing. Some states have granted waivers to a few companies
 - Landfilling continues, many programs have been cancelled, many companies are warehousing recyclable material.
 - Some domestic re-adjustment, but demand curve has only worsens over time, compounded by tech changes/shutdowns.

Situation as of May 2019

- **China still only accepting a fraction of what it used to. Five most important takeaways of the current situation:**
 - Quality remains paramount. We start from >20% and need to get to <0.05%.
 - Other nations/regions began taking overflow, but realized their buyer's position and followed suit. They raised their quality standards and/or lowered their prices.
 - Overall oversupply is continuing to decrease sale prices; this summer will abate situations a bit, but large inventories have been stored in warehouses and will suppress demand long term.
 - Prices are at 12-15 year lows.
 - Consumer demand for finished goods is unchanged or higher, but new mills take A LONG time to come online (and are very expensive and hard to plan in an everchanging, tenuous trade climate).

Main Things People Are Doing / Need To Do

- **Global issue.** As the magnitude of the issue began to unfold in 2017, we recognized this as a global issue – much bigger than WM or any one company/organization.
- **While investment in recycling technology will happen, it cannot get us the entire way.** Average inbound contamination is over 20% and increases each year – hard to get to 0.5%, even with new technology.
- **Potential program changes.** Without significant reductions in contamination, acceptable material lists will likely become more restrictive to force the issue and help achieve a 0.5% target.
- **Additional outlets take time.** New markets will develop, but this will require expansion of smaller markets and creation of new ones, and both require significant capital investment and years before they will come to fruition.

We are working with customers to improve the quality at the curb and trying to diversify end markets, but it will take everyone together.

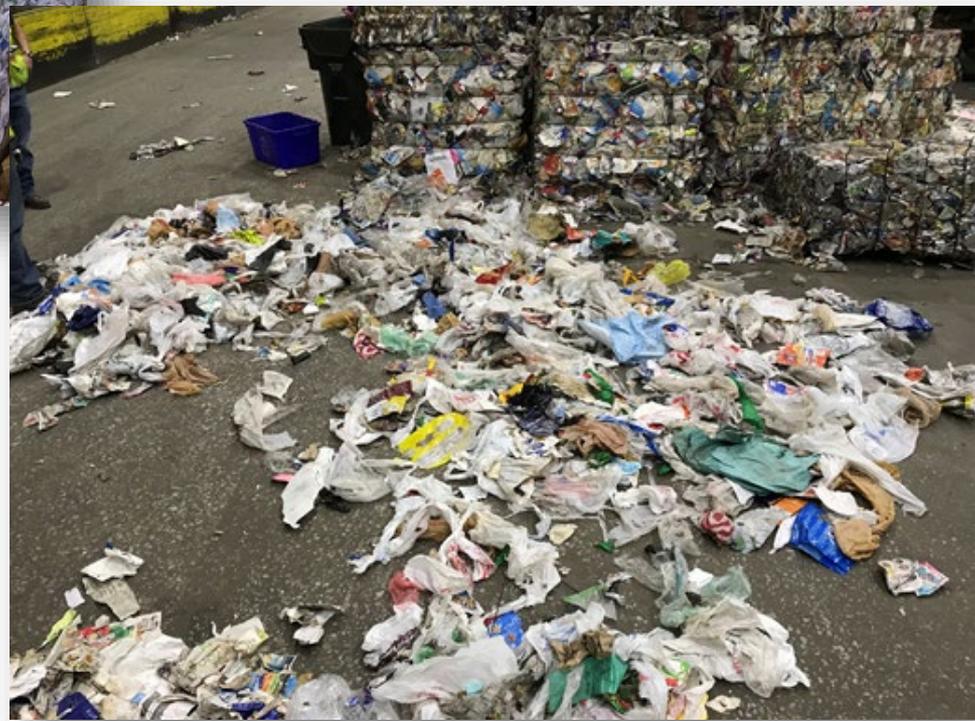
Examples of Contamination – Real Photos from US MRFs



Examples of Contamination – Recyclable...But Not In Your Bin



Examples of Contamination – Recyclable...But Not In Your Bin



Examples of Contamination – “Wishcycling”



Recycle Often Recycle Right – Example Communication Tools

Most Common Contaminants

Keep these common contaminants OUT of your recycling bin.

- NO Recyclables in Plastic Bags**
Empty loose recyclables in bin but leave the plastic bag out.
- NO Food & liquids**
Compost instead! Otherwise, it belongs in the trash.
- NO Electronics & Small Appliances**
Donate if in good condition, or schedule a bulky item pickup, if available. Check earth911.com for a local drop-off site.
- NO Textiles, Bedding, Rugs & Carpet**
Donate these items if they are in good condition. Large quantities may require special disposal.
- NO Hoses, Holiday Lights, Hangers & Extension Cords**
They wrap around equipment and can shut down an entire facility! They all go in the trash.
- NO Plastic Bags, Film Sheeting & Flexible Packaging**
Take plastic bags back to a grocer to keep bins clean and prevent them from shutting down recycling facilities. Use plasticfilmrecycling.org to find a drop-off location near you.
- NO Tires, Auto Parts & Scrap Metal**
(Not in recycling or trash) Can damage equipment & are safety hazards. Contact local scrap recyclers or retail tire stores for recycling options, or check earth911.com.
- NO Concrete, Wood & Construction Debris**
Can damage equipment & are safety hazards. You may be able to schedule a bulky item pickup - otherwise throw it in the trash or order a roll-off bin by earth911.com.

Recycling 101: How to Recycle Right at Work

Waste Management logo and video player interface showing a video titled "NEXT In Visual Composting - What happens to my..."

Mixed Curbside Residential Recycling MYTH BUSTERS

Waste Management logo and icons representing recycling, a house, a recycling bin, and a recycling symbol.

NO PLASTIC BAGS

Item	Rule	Expert Tip
	NO Bagged Recyclables Do not bag recyclables. They must be loose in the bin!	If you store your recyclables in a bag, simply dump them out when you get to your bin and re-use the bag!
	NO Plastic Bags Plastic bags are included in a few curbside programs, check with your local program.	Do not bag recyclables. Plastic bags have a habit of getting tangled in equipment. Find where you can recycle them at plasticfilmrecycling.org .
	NO Plastic Wraps & Film Plastic wrap, bubble wrap, plastic sandwich bags or freezer bags shouldn't go in the recycle bin.	Reuse whenever possible for presents, moving or storage of similar items.
	NO Flexible Packaging Flexible packaging like chip bags and juice or soup pouches cannot be recycled in curbside programs.	This type of packaging is made from multiple materials preventing it from being recycled. It must be trashed.

Business Resources

Staff Recycling Factsheet

Where it comes to recycling, recycle right is just as important as the act itself. We need the right things ending up in the bin to make a difference for the environment. You are an important part of the process.

REMEMBER THESE THREE SIMPLE RULES:

- 1** **Recycle all empty plastic bottles, cans, paper and cardboard.**
- 2** **Keep food and liquids out of my recycling.**
- 3** **Keep plastic bags out of the recycling bin.**
NO BAGGED RECYCLABLES. Take plastic bags back to your grocer.

Here are some additional rules to follow to help your building recycle right:

- Keep Plastic Bags Out Of The Recycling**
This means that both loose plastic bags and recyclable plastic bags should not go in recycling bins. If you must collect recyclables in plastic bags, make sure to empty all recyclables loose into the main bin, and then throw away the plastic bag or reuse.

Always recycle:

- Food & Beverage Cans
- Plastic Bottles & Containers
- Paper
- Food & Beverage Containers
- Flatbed Cardboard & Paperboard
- Shoe Boxes & Containers

DO NOT include in your mixed recycling cart:

- NO Food Waste (Except apples)
- NO Foam Cups & Containers (Check earth911.com for options)
- NO Plastic Bags & Film (Check earth911.com for options)
- NO Tires (Check earth911.com for options)

RecycleRight.com

Welcome to the Building! Please participate in our building's recycling program.

¡Bienvenido al edificio!
Por favor, participe en el programa de reciclaje de nuestro edificio.

The fact is that some recycling actions make a bigger impact than others. So please remember these three basic rules the next time you recycle. Sin duda, ciertas acciones de reciclaje generan un impacto mayor que otras. Por lo tanto, recuerde estas tres reglas básicas la próxima vez que recicle.

- 1** **Recycle all empty plastic bottles, cans, paper and cardboard.**
- 2** **Keep food and liquids out of my recycling.**
- 3** **Keep plastic bags and all other recyclables out of the recycling bin.**
NO BAGGED RECYCLABLES. Take plastic bags back to your grocer.

Here are some additional rules to follow to help your building recycle right. Here are some additional rules to follow to help your building recycle right.

- Keep Plastic Bags Out Of The Recycling**
This means that both loose plastic bags and recyclable plastic bags should not go in recycling bins. If you must collect recyclables in plastic bags, make sure to empty all recyclables loose into the main bin, and then throw away the plastic bag or reuse.

Recycling 101: How to Recycle Right Multi-Family

Waste Management logo

Toolkit Contents

Inside this Recycling Toolkit you will find tips and tools for setting up, refreshing and sustaining a successful recycling program at your property in just three easy steps.

Step 1: Evaluate B/O or Set Up Recycling Infrastructure

Information on how to perform a site assessment, set up recycling bins on your property and train any staff. Tools include:

- Recycling Bin Decal
- Recycling Poster
- Recycling Video
- Setup Checklist

Mythbusters & Social Media posts

Social Media Content

Plastic Bag Recycling

Plastic bags don't belong in your recycling bin. Visit our friends @How2Recycle for recycling locations near you: <http://www.how2recycle.info/store-drop-off>

Don't place plastic bags in your recycling bin. Find nearby recycling locations courtesy of our friends @How2Recycle: <http://www.how2recycle.info/store-drop-off>

Week 1

Apartment & Condo Resources

Improvement Required on Processor/MRF Side

- **Technology.** Use of newer technology will be as important as ever.
 - New MRFs/Technology – Possible with changes to agreements, new agreements, investment from both sides.
 - Focused upgrades of existing MRFs
 - Already in progress, but without additional revenue these upgrades must be surgical or will not justify the cost.
 - Best ROI for upgrades/retrofits.
 - Operational Improvement of Existing Facilities
 - MRFs not always seen as “manufacturing, lean, innovation hubs, etc”.
 - Move away from waste processing / transfer environment.
 - Increase capture and yield through uptime improvements, housekeeping programs, safety systems, etc.
 - Costs associated with changes reflected in new contracts/pricing.

Other Major Items

- **Changes in end market.** Changes in the market are outpacing the development timeline of corresponding end market adjustments.
 - New mills are being built, but they are 100 million to over 1 billion, and take 3-5 or even 10 years to build.
 - Securing funding is hard without stabilization.
- **Global trade policy.** US trade policy is not specifically aimed at recycling and commodity sales, but the ancillary effects are currently tearing through the recycling markets.
 - Tariffs on our exports makes it harder to sell outside US.
 - Tariffs on imports make countries rely on us less (i.e. new end markets may go to non-US locations, less empty containers for reciprocity.)
 - Other effects (ag. piping)
- **Public action and communication.** Understanding the NEED, understanding the WANT, and understanding the HOW. Changes to how communities prices solid waste disposal.

Thank you! Questions?

