

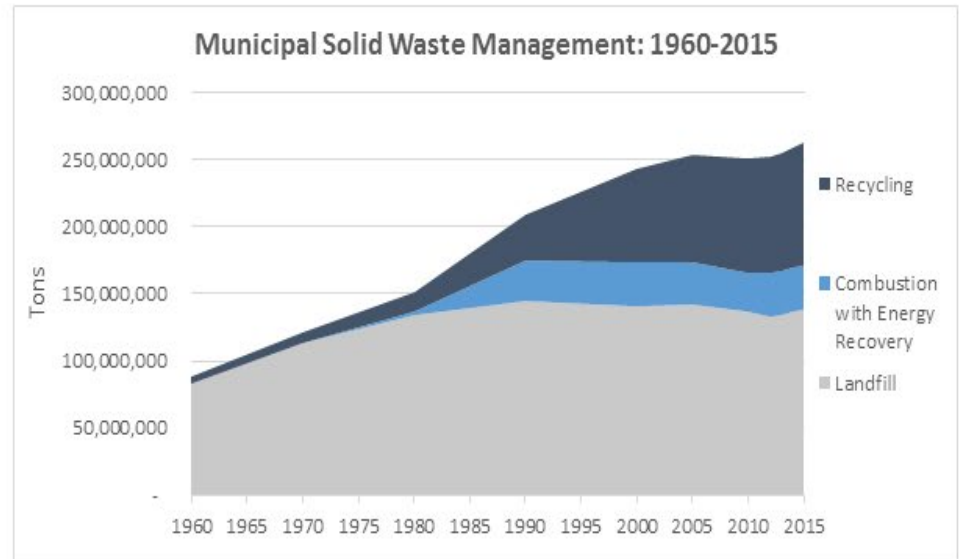


Recycling Market Overview

October 11, 2018

The Evolving Ton

Recycling is growing faster than disposal



Factors Driving Recycling Costs

- ▶ **Participation Rates** – Higher participation, while the current goal, drives additional costs
- ▶ **Pounds Per Set-Out** - Plays a significant role in service cost per household
- ▶ **Commodity Mix** – Changes in the stream can impact processing costs
- ▶ **Residual/Contamination** – Perhaps the largest challenge today due to China Sword, drives costs dramatically
- ▶ **Commodity Value** – Direct impact on any returns

China Sword Explained

- ▶ For decades, China has been the largest importer of the world's recycled commodities, and the U.S. was 40% of the inbound stream.
- ▶ In February 2017, China announced efforts to both improve imported material quality and halt rampant smuggling operations, which included dramatic changes in the acceptance criteria of imported recyclables.
 - ▶ This included a significant reduction in acceptable contamination levels, from anywhere between 5% to 30%, depending on the importer geography, to 0.3% effective March 2018.
 - ▶ Additionally, China banned ALL mixed paper from import, regardless of contamination levels (20% of historical stream).
 - ▶ This was done prior to and unrelated to any current trade/tariff issues.

China Sword Immediate Impacts

- ▶ Materials Recovery Facilities (MRF's) have adjusted processing speeds to improve quality of sorted materials.
 - ▶ As a result, many facilities are unable to handle daily material volume and wait times have increased substantially.
 - ▶ Many facilities are inspecting loads and charging contamination fees.
- ▶ MRF's are adding people to sort lines and increasing inspections to reduce contamination.
- ▶ MRF's are exploring investments in newer, more accurate sorting technology but that is a long-term solution.
- ▶ MRF's are searching for other domestic and international markets, most of which are flooded by the global shift away from China (Vietnam, Malaysia, Thailand, Taiwan and Philippines basically stopped add'l imports last month).

China Sword Immediate Impacts

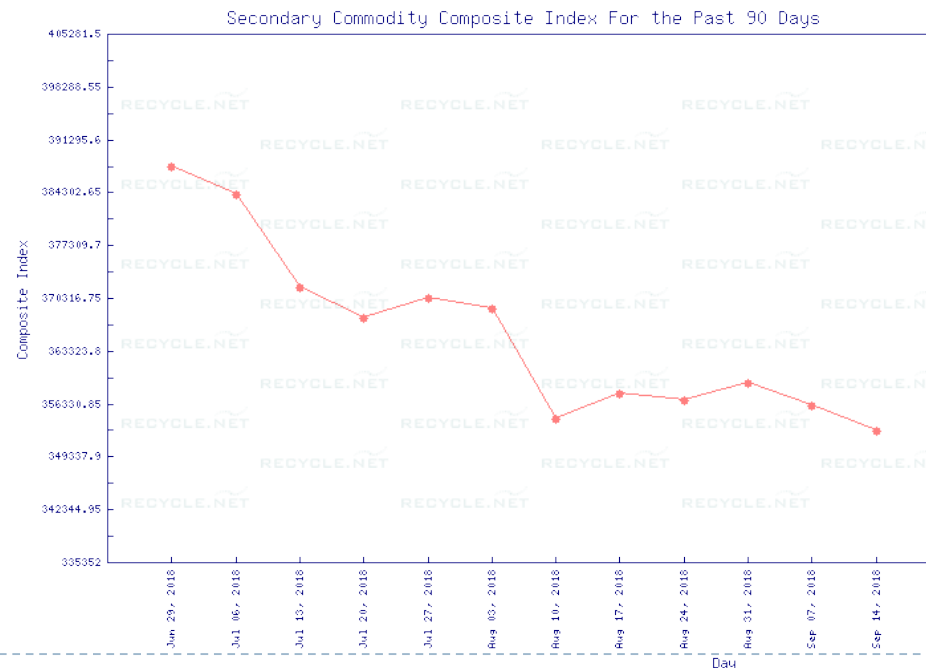
- ▶ Due to a glut in domestic supply with no corresponding demand, materials are sitting and deteriorating, or allowed to be disposed of in landfills or WTE facilities (not in Minnesota yet).



- ▶ Many municipalities throughout the U.S. are telling residents to throw away glass and paper (none in Minnesota).

Commodity Market Trends

- ▶ Glass has a negative value in most markets unless supported by subsidies
- ▶ Corrugated cardboard has decreased in price per ton for the last 5 years
- ▶ End markets have been impacted by global slow-downs and China Sword

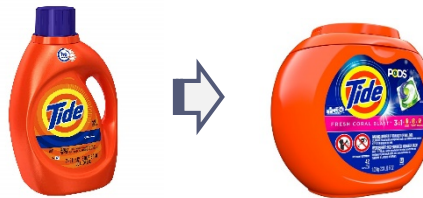


Trash Has Become Complicated

Trends in Material and Implications



Material no longer in circulation
18M tons in 2000 \Rightarrow ~2M in 2015



Lighter-weight and limited end markets
HDPE \Rightarrow off-spec PET



Lighter-weight and flexible packaging not recyclable
Tin can \Rightarrow copolymer pouch

Waste minimization is increasing pressure on total recycling tons (while incentives are based on tons)

Lightweighting of Material

Impact of lightweighting



48,000 plastic bottles = 1 ton



92,000 plastic bottles = 1 ton

Lightweighting requires processing of more material to yield a ton of marketable commodity

The Effects on Current Recycling Business

- ▶ Collection Prices do not cover costs
- ▶ Light-weighting has led to more items per load, with more materials required to process per ton, driving processing costs up
- ▶ Contamination is driving additional costs
- ▶ Overall, we are all working harder to process more tons, for a negative return

What Can Be Done? Short-Term

- ▶ Public Education – WHAT to Recycle – When in Doubt, Toss it Out! No Wishcycling!



- ▶ Public Education – HOW to Recycle
 - ▶ EMPTY – Remove any remaining food or liquid contents from your recyclable item before placing it in a recycling container
 - ▶ CLEAN – Lightly rinse the recyclable item to remove any remaining residue, and
 - ▶ DRY – Gently shake out excess water or let the recyclable item air dry before placing it in a recycling container

Long Term – Reassessment of Accepted Materials

- ▶ Programs have drifted to focus on total diversion rates (total tons), rather than what materials are truly beneficial to recycle.
- ▶ Some collected materials are recyclable, but lack local end markets, or have a negative recycling value. These realities render the processed materials unmarketable.
- ▶ Municipalities need to shift program focus to Sustainable Materials Management-based views, which look at the overall benefits of each accepted material in the stream vs. simply diverting more material that may have no beneficial use.
- ▶ In Minnesota this requires State Legislative changes and MPCA involvement.

Next Steps

- ▶ The decades old recycling model is no longer executable or viable. Immediate partnering is needed, as well as a new business model.
- ▶ Price Increase is needed to address the shortfall due to collection costs no longer covered by commodity revenues.
- ▶ Implement Public Education programs to inform residents what to recycle and how to recycle – clean up the contamination in the stream.