



*By Liz Bedard and Patty Moore*

## \$ORTING FOR Value

Sorting out different kinds of plastic from single-stream recycling collection can be a challenge, but is it worth it? A new study is showing – in a completely visual way – that effectively separating out plastics by resin is where the smart money is at your MRF.

**T**he Association of Postconsumer Plastic Recyclers (APR), North America's largest alliance of plastics reclaimers, is constantly seeking ways to strengthen the economic viability and environmental effectiveness of post-consumer plastics recycling. In the current market, finding effective ways to recycle all the plastics outside the bottle realm is becoming a larger priority.

As most readers well know, recycling plastics other than PET and HDPE bottles brings challenges for many parties, including individual recyclers, public policy makers, brand name companies, collectors, resin companies and reclaimers. In the spring of 2009, APR formed the Rigid Plastics Recycling Program to proactively address the issue of non-bottle plastic recycling.

But the need for data and strategy in the non-bottle space truly came to a head in early 2013. That's when China's Operation Green Fence policy sent materials recovery facility (MRF) operators scrambling for alternative markets for mixed plastic bales. Fortunately, many found that domestic plastic reclaimers are, in fact, interested in purchasing non-bottle rigid plastic material.

Although specific sorting by the generator – usually a MRF – is

necessary to access some of these domestic markets, the additional sorting may well result in additional revenue. For a MRF faced with deciding how best to sort their rigid plastics, there are many questions to be answered: What sorting options should be considered? Which sorting moves make the most economic sense? How much additional revenue will result in additional sorting?

To help answer these questions, the APR Rigids Program worked with Moore Recycling Associates to develop a graphic tool called the Sort for Value Matrix that illustrates the economic value of sorting recyclable rigid plastics.

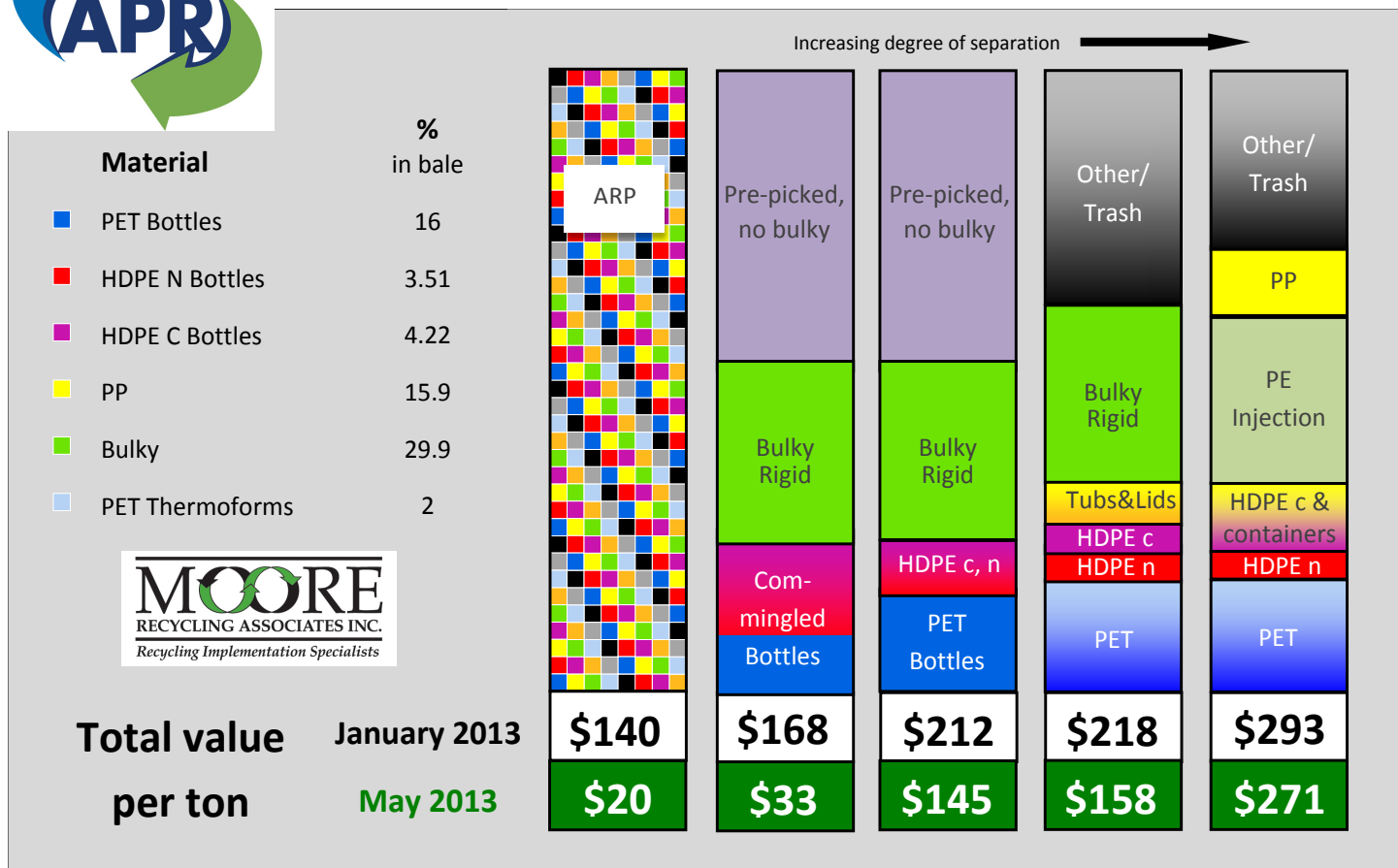
### Methodology

The first step in developing the matrix was determining marketable types of rigid plastic bales. APR and Moore determined that MRFs generally have the following options for sorting and then marketing their recyclable rigid plastic:

1. All rigid containers (all mixed rigid plastics including bulky items, excludes film and foam)



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2. Comingled bottles
3. Bulky rigids (buckets, totes, crates, lawn furniture, carts, storage bins, etc.)
4. Pre-picked rigids excluding bulky (bottles and containers with PET and HDPE bottles removed, previously called Nos. 3-7)
5. PET bottles
6. PET – bottles and thermoforms
7. HDPE bottles – colored and natural
8. HDPE colored bottles
9. HDPE natural bottles
10. HDPE colored bottles and containers
11. Polyethylene (PE) injection grade (this covers “PE only” buckets, totes, crates, lawn furniture, carts, storage bins, etc.)
12. Polypropylene (PP)
13. Tubs and lids (PE and PP containers)

The next step was to document historic average pricing, in particular before and after implementation of the Green Fence. During the fall of 2013, APR’s Plastic Reclaimer members received a survey requesting January 2013 and May 2013 pricing of the above commodities. Their responses, combined

with Moore Recycling’s in-house pricing database information, provided the foundation for valuing rigid plastic bales.

The third component in developing the matrix was establishing the composition of the various rigid plastic bales. Moore Recycling used data from the “National Mixed Rigid Plastic Bale Composition Study,” which was funded by APR’s Rigid Plastics Recycling Program and conducted by Moore Recycling in 2010-2011, to determine the makeup of the various types of mixed rigid plastic bales generated in North America.

## Interpreting the graphic

The first column on the left in the matrix represents one ton of unsorted rigid plastics (this bar is called All Rigid Plastics). Using the composition data from all rigid plastic bales (as determined in the “National Mixed Rigid Plastic Bale Composition Study” noted above), each successive bar to the right represents the same ton of material broken out into discrete product types. The second bar, for instance, divides the ton using three sorts, the

third bar has four sorts and the last two bars have five sorts each.

A quick review of the matrix reveals there has been a shift in the economic value of sorting plastics since the Green Fence went up. In particular:

1. Overall, there has been a drop in the value of all bales of rigid plastics, with all rigid plastics (the first bar) realizing the greatest loss by percent – an 86 percent decrease – dropping from an average value of \$140 to \$20 per ton.
2. Additional sorting reduced the impact of the Green Fence. The value bars show the gap between pre- and post-Green Fence value is reduced as plastics are more extensively sorted.
3. The smallest drop in plastics value is seen in the last bar, where the value of a ton of plastics only decreased 8 percent due to the Green Fence, dropping from \$293 to \$271 per ton.
4. The matrix shows that the highest value for a ton of plastics is realized when the material is sorted into the following five categories:
  - a. PET bottles and thermoforms
  - b. HDPE natural bottles

- c. HDPE color bottles and HDPE containers
- d. PE injection grade
- e. Polypropylene (PP)

## What's left over

The “National Mixed Rigid Plastic Bale Composition Study” found a fairly high percentage of contamination (an average of 13 percent in all rigid plastic bales). In addition, a percentage of the bales (16 percent to 25 percent) do not currently have domestic buyers if separated as indicated. Thus, with more sorting comes more trash and non-salable material, but also cleaner products worth more per ton. In the first three bars, the other or trash is mixed with the commodities (one of the reasons those bales carry lower values). Please note that we have found that reclaimers that purchase mixed resin bales reported that they do not dispose of the “other” material and are able to find uses or markets for much of it, likely because their volumes help them find buyers or their processes have some flexibility.

Thus, in the higher-level sorts, the total value per ton does not factor in the cost of disposing of the non-salable material. Tip fees vary, so users need to account for that additional cost.

## Conclusions

The APR Rigids Committee is pleased with the outcome of the Sort for Value Matrix. It will provide MRF operators and others with a solid base of information as they evaluate options for sorting rigid plastics.

For those interested in learning more about the matrix, APR is holding a webinar in spring 2014 and more information will be available as the details are finalized.

In addition, the APR Rigid Plastics Recycling Committee is looking at ways to expand the usefulness of the Sort for Value Matrix. Updated historic pricing may be key, so additional pricing surveys may be conducted. Also under consideration is the

## Problem solvers

Current members of APR's Rigid Plastics Recycling Program, which was formed in 2009 to investigate non-bottle plastics recycling:

The American Chemistry Council  
 Avangard  
 Berry Plastics  
 Blue Ridge Plastics  
 Champion Polymer  
 Clean Tech Inc.  
 ConAgra Foods  
 Custom Polymers, Inc.  
 Dart Container  
 Denton Plastics  
 The Dow Chemical Company  
 Entropex  
 Envision Plastics  
 Graham Recycling Company  
 Green Mountain Coffee  
 Haycore Canada, Inc.  
 IntegriCo Composites  
 Kimberly-Clark  
 KW Plastics Recycling  
 Merlin Plastics Supply, Inc.  
 Milliken & Company

Moore Recycling Associates  
 MRC Polymers  
 NAPCOR  
 NatureWorks LLC  
 New York City Department of Sanitation  
 N.C. Environmental Assistance and Customer Service  
 Oregon Department of Environmental Quality  
 Perpetual Recycling Solutions  
 Plastics Forming Enterprises (PFE)  
 Prime Plastic Products  
 Procter & Gamble  
 ReCommunity  
 Recyc RPM  
 Rehrig Logistics  
 Sims Municipal Recycling  
 Starbucks  
 Starlinger  
 Talco Plastics, Inc.  
 Waste Management Recycle America

creation of an online calculator that would allow individuals to enter their own information on recyclable plastics scrap value and disposal costs (or use default data), thereby creating a customized decision-making tool based specifically on individual situations.

These are exciting times for plastics recycling in the U.S., Canada and Mexico. Domestic markets are available for all the rigid plastic bales in the matrix and new markets are always emerging. MRFs should review their plastic sorting strategies to ensure that they are handling material to the best economic advantage and this matrix should help them do so. APR members are always looking for additional quality plastic scrap and encourage MRFs to “think domestically” when sorting and marketing their recyclable plastics.

Underlying this work is the desire to assist MRFs in finding solid markets for

the recyclable plastics they generate. APR's website ([www.plasticsrecycling.org](http://www.plasticsrecycling.org)) contains up-to-date information on what APR members purchase. In addition, [www.plasticsmarkets.org](http://www.plasticsmarkets.org), which is put together by Moore Recycling Associates, is a good place to explore options for marketing rigid plastics. **RR**

Feedback is always welcome, so industry members with thoughts on this new recycling tool are encouraged to contact either Liz Bedard, director of the APR Rigid Plastics Recycling Program, at [ebedard18@gmail.com](mailto:ebedard18@gmail.com), or Patty Moore, president of Moore Recycling, at [patty@moorerecycling.com](mailto:patty@moorerecycling.com).

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