



State of Oregon
Department of
Environmental
Quality

Plastics Recovery Assessment Project

Plastics Recovery Assessment Advisory Workgroup Meeting May 8, 2014



Reclay StewardEdge
Product Stewardship Solutions

with



Today's Agenda

Time (PDT)	Topic
1:30-1:40	Welcome and introductions
1:40-1:50	Project background, goals, and objectives
1:50-2:00	Existing initiatives
2:00-2:40	Overview of plastics generation, recycling, recycling rates, and disposal
2:40-3:00	Markets overview
3:00-3:10	<i>Break</i>
3:10-4:10	Sorting technologies overview
4:10-4:30	Concluding questions, wrap-up, and next steps

Welcome and Introductions

- Introduction
- Rest room facilities and wireless internet access
- Introductions of consultants and advisory workgroup members

Project Background, Goals, and Objectives

Summary of First Meeting Outcomes

- Advisory Workgroup met last year before choosing consultant
- Purpose – to develop scope of work for project, determine sources of data, and develop partnerships
- Developed the subject matter to be covered in the report

Overview of Contractor Scope

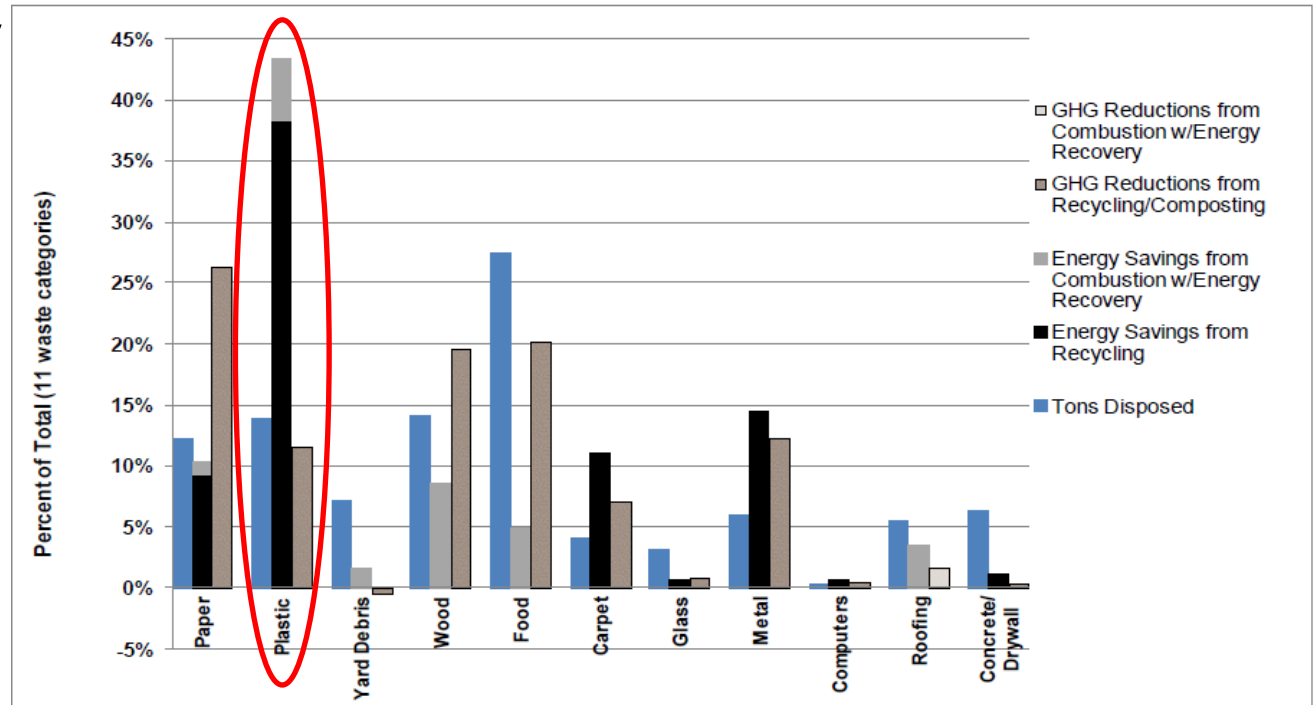
1. Quantify plastics disposal and recycling
2. Assess markets
3. Evaluate sorting technologies
4. Assess infrastructure
5. Analyze options
6. Assess lifecycle impacts of options
7. Participate in advisory workgroup meetings, prepare working papers, prepare reports

Schedule and Meeting Dates

Task or deliverable	Week beginning date	April				May				June					July				August			
		7	14	21	28	5	12	19	26	2	9	16	23	30	7	14	21	28	4	11	18	25
1. Plastics Disposal and Recycling																						
2. Markets Assessment																						
Compile/summarize existing markets data																						
Rresearch existing/potential markets capacity/specs																						
Prepare markets summary and analysis of gaps/barriers																						
3. Sorting Technology Evaluation																						
Prepare profiles of sorting technologies																						
Assess sorting technologies used by OR MRFs/markets																						
4. Infrastructure Assessment																						
Gather Oregon recycling infrastructure data																						
Model exisiting recycling/recovery																						
5. Options Analysis																						
Prepare meeting documents (policy, program options)																						
Model increased recycling/recovery scenario																						
6. Lifecycle Impacts Assessment																						
7. Project Guidance, Communications, and Reports																						
Working Group Meeting 1																						
Working Group Meeting 2																						
Working Group Meeting 3																						
Draft Project Report																						
Final Project Report																						

Project Objectives

- Determine how more plastic can be recovered from the waste stream for useful purposes
- Recommendations to guide state policy for plastics
- Save energy



Goals for this Meeting

- Advisory group advice on
 - Plastics types with practical potential for increased recycling and recovery
 - Categories of plastics for which more detailed information should be developed
 - Collection and processing systems for which more detailed information should be developed
 - Potential scenarios under which increased recycling and recovery could occur
 - Potential state policy approaches to support increased recycling and recovery

Existing Initiatives

Materials Management 2050 Vision

*Oregonians in 2050 produce and use materials responsibly
conserving resources • protecting the environment • living well*

- Materials Management – looking at the impact of materials over their entire lifecycle, not just at end of life
- 2050 Vision and Framework for Action adopted December 6, 2012
- “ ... Oregonians live within the limits of our sustainable share of the world’s natural resources....”

Existing Initiatives

- Other connected work also going on in DEQ's Material Management program:
 - Working on proposed legislation for 2015 Legislature
 - Recycling Opportunity Subgroup's proposals for commercial recycling, enhanced dry waste recovery
 - Goals and Measures – setting material-specific goals for plastics, food waste, and carpet
 - **Plastics** group will help develop potential plastics goals:
 - What plastics to include?
 - What goals to set?
- Forthcoming changes to Oregon's beverage container deposit program

Committee Feedback and Discussion

- General comments?
- Should state policy action consider requiring the processing of certain waste streams prior to disposal to recover plastics and other non-recycled materials?
 - such as C&D, commercial waste, electronics plastics, or shredder residue?
- Should Oregon's recycling opportunity requirements be expanded to be more comprehensive in terms of commercial and public space recycling?
 - or specifically identify plastic types that must be collected?
- Should a differentiation be made between requirements for major urban areas versus the remainder of Oregon?

The background of the slide is a collage of various plastic bottles, including clear, blue, green, and brown ones, some of which are crushed or broken. The text is overlaid on this background.

Plastics Generation, Recycling, Recycling Rates, and Disposal—Overview

Overview of Plastics Quantities

Plastics generation, recycling, recycling rates, and disposal

- Data sources, methods, and data limitations
- Overall estimates by plastic type
 - Recycling
 - Disposal
- Residential estimates
 - Details by material type
- Commercial and institutional estimates
 - Overall
 - Sector estimates



Approach & Data Sources

Oregon DEQ data sources:

- *Background Paper: Plastic Recovery Assessment Project—Overview of Plastic Recycling and Disposal Information (2013)*
- *2012 Oregon Material Recovery and Waste Generation Rates Report (2013)*
- *Composition of Commingled Recyclables Before and After Processing (2011)*
- *Oregon's Rigid Plastic Container Recycling Rate for 2007 and Determination of the Recycling Rate for Compliance Purposes for 2009 (2008)*
- *2009/2010 Waste Composition Study, data tables*
- *Trends in Oregon Waste Generation 1993–2010 (2011)*

Additional Data Sources

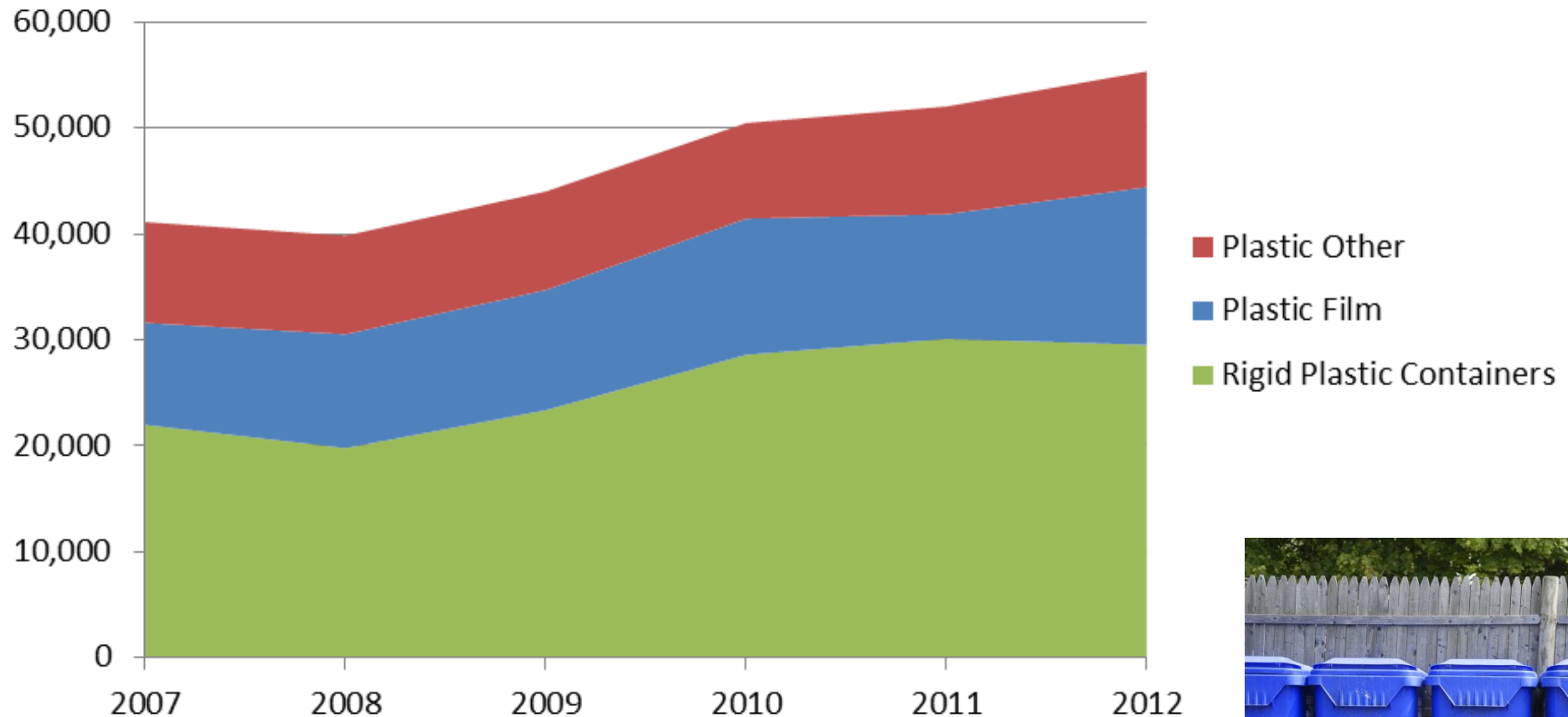
- California (2006)
- Los Angeles, California (2007)
- New York City (2012–2013)
- Ontario, Canada (2001, 2011)
- Vermont (2013)
- Washington State (2009)
- Wisconsin (2009)
- U.S. Census Bureau





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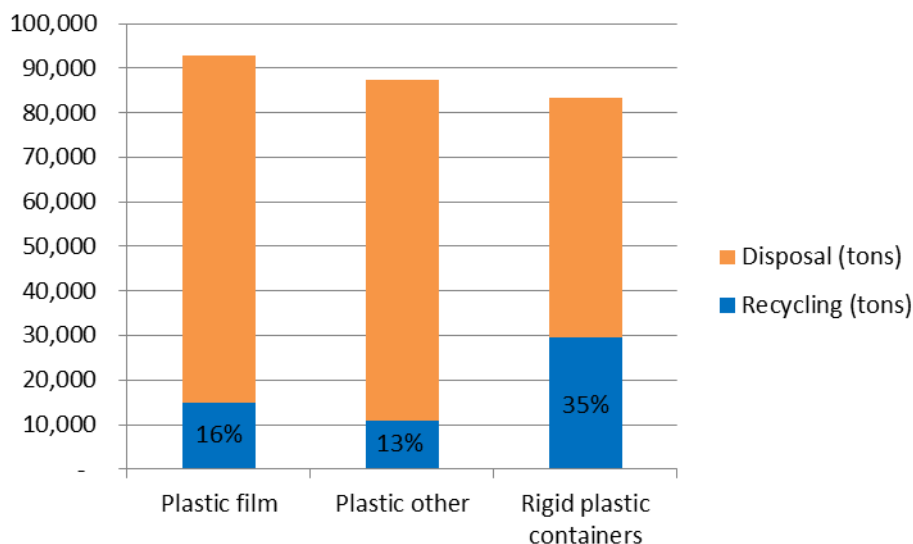
Oregon Plastic Recycling, 2007-2012



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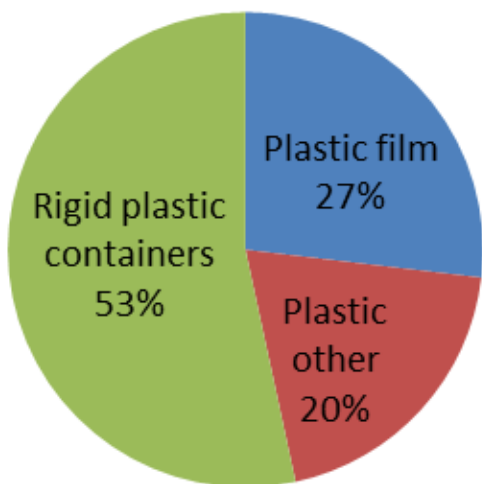
Recycling & Disposal (2012)



Plastics Type	Recycling (tons)	Disposal (tons)	Generation (tons)	Recycling Rate (%)
Rigid plastic containers	29,541	53,774	83,315	35%
Plastic film	14,869	78,014	92,883	16%
Other plastic	10,922	76,349	87,271	13%
Plastic subtotal*	55,332	208,136	263,468	21%

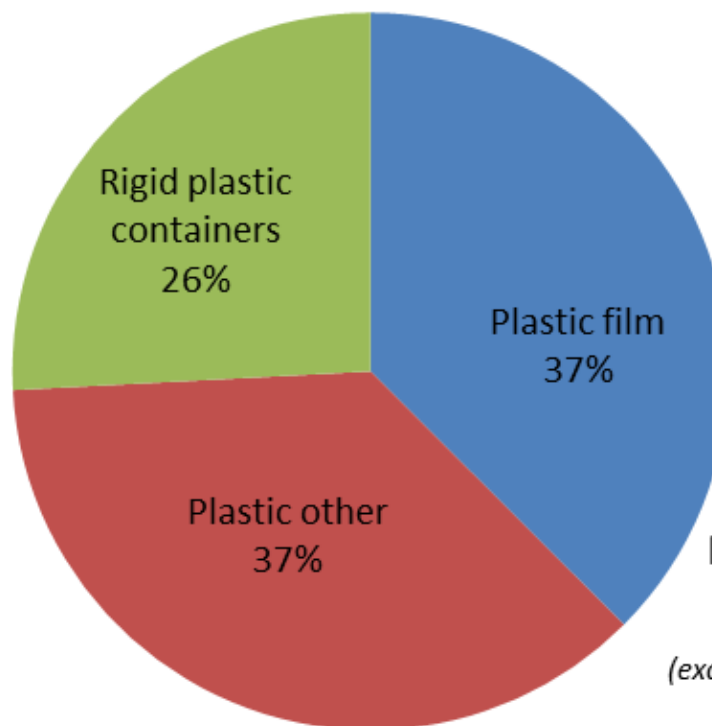
Plastic Recycling vs. Disposal

Recycling



Plastic recycling:
55,332 tons
(excluding composite/foam)

Disposal



Plastic disposal:
208,136 tons
(excluding composite/foam)

(not to scale)



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Plastic Disposal by Waste Stream

	OVERALL		Residential Single-Fam.		Residential Multifam.		Commercial		Drop Box		Self-haul	
	% Total Disposal	Tons	% Total Disposal	Tons	% Total Disposal	Tons	% Total Disposal	Tons	% Total Disposal	Tons	% Total Disposal	Tons
TOTAL DISPOSAL TONS		2,248,715		513,611		178,780		744,690		226,246		519,879
TOTAL PLASTIC	10.17%	228,757	10.07%	51,720	10.20%	18,228	11.57%	86,145	10.04%	22,723	7.26%	37,738
Plastic Packaging	4.65%	104,470	5.69%	29,209	5.55%	9,925	5.91%	44,025	3.44%	7,776	1.97%	10,228
Rigid Plastic Containers (RPCs)	1.56%	35,108	2.04%	10,478	2.09%	3,733	1.98%	14,717	1.07%	2,425	0.55%	2,838
Deposit plastic bottles	0.05%	1,175	0.05%	245	0.07%	131	0.08%	605	0.03%	61	0.02%	100
Plastic deposit water	0.07%	1,527	0.08%	406	0.09%	156	0.10%	744	0.05%	108	0.02%	86
No-deposit plastic beverage bots.	0.25%	5,551	0.28%	1,452	0.31%	545	0.31%	2,319	0.32%	732	0.07%	380
Other plastic bottles	0.41%	9,241	0.63%	3,251	0.59%	1,060	0.47%	3,519	0.11%	239	0.17%	886
Plastic tubs, curb-OK 8oz to 5gal	0.33%	7,471	0.32%	1,633	0.38%	681	0.44%	3,272	0.34%	763	0.16%	848
Other RPCs - tubs, trays, etc.	0.45%	10,144	0.68%	3,492	0.65%	1,159	0.57%	4,257	0.23%	523	0.10%	539
Other plastic packaging	3.08%	69,362	3.65%	18,731	3.46%	6,191	3.94%	29,309	2.37%	5,351	1.42%	7,390
Other rigid plastic packaging	0.83%	18,665	1.16%	5,947	0.99%	1,775	0.96%	7,138	0.49%	1,116	0.39%	2,033
Plastic bev. bots. <8oz or >5 gal	0.00%	90	0.01%	29	0.01%	14	0.00%	35	0.00%	3	0.00%	7
Small tubs 6+oz but <8oz	0.03%	636	0.05%	252	0.04%	77	0.03%	239	0.02%	36	0.00%	24
Other rigid plastic packaging	0.80%	17,940	1.10%	5,666	0.94%	1,684	0.92%	6,864	0.48%	1,076	0.38%	2,001
Plastic film packaging - estimated	2.25%	50,697	2.49%	12,784	2.47%	4,416	2.98%	22,171	1.87%	4,235	1.03%	5,358
Plastic Products	5.53%	124,287	4.38%	22,511	4.64%	8,304	5.66%	42,119	6.61%	14,947	5.29%	27,511
Rigid plastic products	4.31%	96,969	3.04%	15,628	3.31%	5,925	4.05%	30,173	5.60%	12,663	4.74%	24,620
Other rigid plastic products	3.40%	76,349	2.21%	11,353	2.45%	4,380	3.21%	23,927	3.79%	8,573	4.09%	21,246
Mixed plastic / materials	0.92%	20,620	0.83%	4,275	0.86%	1,544	0.84%	6,246	1.81%	4,090	0.65%	3,374
Plastic film products - estimated	1.21%	27,317	1.34%	6,883	1.33%	2,379	1.60%	11,946	1.01%	2,284	0.56%	2,891



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Res/Comm Disposal by Plastic Type: Vermont Applied to Oregon (top categories)

	Residential Single-Family			Residential Multifamily			Commercial		
	%TotDisp	%Plastics	Tons	%TotDisp	%Plastics	Tons	%TotDisp	%Plastics	Tons
Total Stream Disposal			513,607			178,787			744,687
1a #1 PET Bottles EBB	0.1%	0.8%	388	0.1%	0.9%	171	0.1%	1.2%	1,032
2 #1PET Food and Dairy Bottles and Jars	0.3%	3.1%	1,599	0.3%	3.0%	547	0.2%	1.5%	1,335
4 HDPE Food and Dairy and Detergent	0.5%	5.4%	2,799	0.5%	5.3%	958	0.5%	4.5%	3,871
6b Plastic Cups PP	0.2%	1.5%	773	0.1%	1.3%	230	0.2%	1.5%	1,307
6c Plastic Cups PS	0.1%	1.4%	706	0.1%	1.4%	262	0.0%	0.4%	326
6d Plastic Cups Keurig	0.1%	1.3%	673	0.2%	1.5%	271	0.1%	0.6%	527
7b Tubs and Lids PP	0.2%	1.9%	987	0.2%	2.2%	397	0.3%	2.6%	2,283
7c Tubs and Lids PS	0.1%	1.1%	543	0.1%	1.1%	201	0.0%	0.3%	244
8a Bulky Rigid >1 Gallons PE	0.1%	1.2%	597	0.1%	1.2%	221	0.0%	0.3%	244
8c Bulky Rigid >1 Gallons Other	0.6%	6.0%	3,096	0.6%	6.3%	1,147	0.8%	7.0%	6,023
8d Bulky Rigid >1 Gallons PE Buckets	0.2%	1.7%	869	0.2%	1.8%	322	0.0%	0.1%	81
9a Thermoforms PET	0.4%	3.7%	1,932	0.3%	3.2%	574	0.3%	2.7%	2,288
9b Thermoforms PS	0.2%	1.7%	901	0.1%	1.5%	268	0.1%	1.1%	981
9d Thermoforms PP	0.2%	2.2%	1,159	0.2%	1.9%	345	0.1%	0.8%	654
9f Thermoforms Other	0.2%	1.5%	773	0.1%	1.3%	230	0.2%	1.5%	1,307
10 Film, Retail Bags	0.5%	4.6%	2,402	0.5%	4.6%	830	0.2%	1.6%	1,418
11 Film, Other Bags	0.9%	9.1%	4,713	0.9%	8.9%	1,628	0.6%	5.3%	4,554
12 Film, Wrap	0.6%	5.7%	2,945	0.6%	5.6%	1,018	2.3%	19.8%	17,096
13 Film, Garbage	1.3%	13.0%	6,707	1.3%	12.7%	2,317	1.2%	10.1%	8,660
14a Film, Other	0.5%	5.3%	2,719	0.5%	5.2%	939	0.3%	2.6%	2,240
17b Other Plastic All Other	2.3%	23%	12,004	2.5%	24%	4,448	3.4%	30%	25,476
Plastics Totals	10%	100%	51,720	10%	100%	18,229	12%	100%	86,144



Materials representing 1-2% of plastics in collection stream

Materials representing more than 2% of plastics in collection stream

Residential Disposal by Plastic Type: NYC Applied to Oregon (top 20)

Residential Plastic Disposal			Annual Total Disposal		692,391
			Annual Plastic Disposal		69,948
Subclass	Resin Container Type	Resin Subsort Category	%Total Disp	%Plastic Disposal	Tons
#1 PET Clear/Green Bottles-Food	Plastic Bottles	#1 PET Clear/ Green	0.1%	1.3%	881
#2 HDPE Natural Bottles-Milk/Soy/Dairy	Plastic Bottles	#2 HDPE Natural	0.2%	1.8%	1,226
#2 HDPE Pigmented Bottles-Non-Food/Non-Beverage	Plastic Bottles	#2 HDPE Pigmented	0.2%	1.5%	1,047
#1 PET Thermoforms	#1 PET Thermoforms	#1 PET Clear/ Green	0.5%	5.4%	3,798
Tubs/Lids Excluding #6 Polystyrene-#5 PP Rigid	Tubs/Lids Excluding #6 Polystyrene	#5 PP Rigid	0.2%	1.6%	1,106
Tubs/Lids Excluding #6 Polystyrene-Unlabeled Resin	Tubs/Lids Excluding #6 Polystyrene	Unlabeled Resin	0.2%	2.2%	1,570
#6 Rigid Polystyrene Containers/Packaging	#6 Rigid Polystyrene Containers/Packaging	#6 PS Rigid	0.1%	1.3%	930
#6 EPS Containers/Packaging	#6 EPS Containers/Packaging	#6 PS Expanded	0.4%	4.0%	2,819
Other Rigid Containers/Packaging-Unlabeled Resin	Other Rigid Containers/Packaging	Unlabeled Resin	0.3%	2.9%	2,005
Film Plastic: Retail Bags and Sleeves	Film Plastic: Retail Bags and Sleeves	Polyethylene Film (HD/LD/LLD)	0.4%	4.4%	3,059
Film Plastic: Garbage Bags	Film Plastic: Garbage Bags	Polyethylene Film (HD/LD/LLD)	2.2%	21.5%	15,047
Film Plastic: Other #2/#4 Polyethylene-Polyethylene Film (HD/LD/LLD)	Film Plastic: Other #2/#4 Polyethylene	Polyethylene Film (HD/LD/LLD)	0.1%	1.5%	1,026
Film Plastic: Other Non-PE/Contaminated-Non-PE Film	Film Plastic: Other Non-PE/Contaminated	Non-PE Film	1.0%	10.4%	7,262
Single Use Plates/Cups/Cutlery-#5 PP Rigid	Single Use Plastic Plates/Cups/Cutlery	#5 PP Rigid	0.1%	1.0%	709
Single Use Plates/Cups/Cutlery-#6 PS Rigid	Single Use Plastic Plates/Cups/Cutlery	#6 PS Rigid	0.2%	2.1%	1,456
Single Use Plates/Cups/Cutlery-#6 PS Expanded	Single Use Plastic Plates/Cups/Cutlery	#6 PS Expanded	0.5%	4.7%	3,318
Single Use Plates/Cups/Cutlery-Unlabeled Resin	Single Use Plastic Plates/Cups/Cutlery	Unlabeled Resin	0.3%	2.7%	1,856
Appliances: Unlabeled Resin	Appliances: Plastic	Unlabeled Resin	0.2%	2.3%	1,612
Bulk/Rigid: Toys/Housewares-Unlabeled Resin	Bulk/Rigid Plastic: Toys/Housewares	Unlabeled Resin	0.5%	5.4%	3,754
Other Plastics-Unlabeled Resin	Other Plastics	Unlabeled Resin	0.9%	8.5%	5,914
Portion these plastics represent:			8.7%	86.3%	60,395



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Commercial Disposal by Sector, p1: Vermont Applied to Oregon (top 10)

	Agriculture/ Fisheries		Educational Services		Financial Services		Food Stores		Government Facilities		Accommodation	
Plastics Types	%Plastics	Tons	%Plastics	Tons	%Plastics	Tons	%Plastics	Tons	%Plastics	Tons	%Plastics	Tons
Total Sector Disposal		19,742		44,762		23,374		35,707		26,456		17,395
1a #1 PET Bottles EBB	0.4%	11	4.2%	194	10.3%	600	1.2%	41	4.4%	155	4.0%	56
1b #1 PET Bottles BB	0.1%	2	0.8%	37	2.0%	115	0.2%	8	0.8%	30	0.8%	11
2 #1PET Food and Dairy Bottles and Jars	0.2%	4	1.6%	75	4.0%	231	0.4%	16	1.7%	60	1.5%	22
4 HDPE Food and Dairy and Detergent	1.8%	50	2.6%	119	1.2%	69	4.5%	160	2.5%	89	7.1%	99
5c # 3 - 7 Bottles Non	2.1%	59	0.4%	19	0.2%	9	0.1%	3	0.2%	8	0.2%	3
6b Plastic Cups PP	2.1%	59	0.4%	19	0.2%	9	0.1%	3	0.2%	8	0.2%	3
6c Plastic Cups PS	2.1%	59	0.4%	19	0.2%	9	0.1%	3	0.2%	8	0.2%	3
6e Plastic Cups Other	2.1%	59	0.4%	19	0.2%	9	0.1%	3	0.2%	8	0.2%	3
7b Tubs and Lids PP	6.9%	191	1.3%	60	0.5%	30	0.3%	10	0.8%	27	0.6%	8
7e Tubs and Lids Other	2.6%	73	0.5%	23	0.2%	12	0.1%	4	0.3%	11	0.2%	3
8a Bulky Rigid >1 Gallons PE	0.2%	5	0.3%	12	0.1%	7	0.5%	17	0.3%	9	0.7%	10
8b Bulky Rigid >1 Gallons PP	2.6%	73	0.5%	23	0.2%	12	0.1%	4	0.3%	11	0.2%	3
8c Bulky Rigid >1 Gallons Other	39.1%	1,086	7.5%	344	3.0%	172	1.6%	56	4.4%	156	3.4%	47
9a Thermoforms PET	0.1%	3	1.1%	52	2.8%	161	0.3%	11	1.2%	42	1.1%	15
9f Thermoforms Other	2.1%	59	0.4%	19	0.2%	9	0.1%	3	0.2%	8	0.2%	3
10 Film, Retail Bags	0.5%	14	1.7%	77	1.9%	112	2.4%	86	1.9%	66	1.7%	23
11 Film, Other Bags	1.6%	43	5.4%	249	6.2%	359	7.8%	277	6.0%	211	5.3%	75
12 Film, Wrap	5.9%	163	20.4%	934	23.2%	1,347	29.4%	1,042	22.5%	792	20.0%	282
13 Film, Garbage	3.0%	83	10.3%	473	11.7%	682	14.9%	528	11.4%	401	10.1%	143
14a Film, Other	0.8%	21	2.7%	122	3.0%	176	3.9%	136	2.9%	104	2.6%	37
14b Film, Other Metalized	0.1%	4	0.4%	20	0.5%	29	0.6%	23	0.5%	17	0.4%	6
17a Other Plastic Blister	0.1%	4	0.3%	15	0.3%	15	0.3%	10	0.3%	12	0.4%	5
17b Other Plastic All Other	13%	367	34%	1,536	27%	1,550	30%	1,051	35%	1,223	37%	517
Plastics Totals	100%	2,779	100%	4,581	100%	5,813	100%	3,542	100%	3,522	100%	1,407
Top 10 materials												



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Commercial Disposal by Sector, p2: Vermont Applied to Oregon (top 10)

	Information		Manufacturing		Medical Services		Other Misc Services		Professional Services	
Plastics Types	%Plastics	Tons	%Plastics	Tons	%Plastics	Tons	%Plastics	Tons	%Plastics	Tons
Total Sector Disposal		3,815		121,585		87,360		56,927		58,518
1a #1 PET Bottles EBB	0.7%	8	2.0%	310	1.9%	192	3.0%	180	2.5%	144
1b #1 PET Bottles BB	0.1%	2	0.4%	60	0.4%	37	0.6%	35	0.5%	28
2 #1PET Food and Dairy Bottles and Jars	0.3%	3	0.8%	119	0.7%	74	1.2%	69	1.0%	56
4 HDPE Food and Dairy and Detergent	0.2%	2	4.5%	689	4.6%	460	11.6%	696	5.8%	337
5c # 3 - 7 Bottles Non	0.0%	0	0.0%	7	0.4%	41	0.1%	9	0.2%	9
6b Plastic Cups PP	0.0%	0	0.0%	7	0.4%	41	0.1%	9	0.2%	9
6c Plastic Cups PS	0.0%	0	0.0%	7	0.4%	41	0.1%	9	0.2%	9
6e Plastic Cups Other	0.0%	0	0.0%	7	0.4%	41	0.1%	9	0.2%	9
7b Tubs and Lids PP	0.1%	2	0.1%	22	1.3%	135	0.5%	28	0.5%	29
7e Tubs and Lids Other	0.1%	1	0.1%	8	0.5%	52	0.2%	11	0.2%	11
8a Bulky Rigid >1 Gallons PE	0.0%	0	0.5%	71	0.5%	48	1.2%	72	0.6%	35
8b Bulky Rigid >1 Gallons PP	0.1%	1	0.1%	8	0.5%	52	0.2%	11	0.2%	11
8c Bulky Rigid >1 Gallons Other	0.8%	9	0.8%	123	7.6%	766	2.7%	160	2.8%	162
9a Thermoforms PET	0.2%	2	0.5%	84	0.5%	52	0.8%	49	0.7%	39
9f Thermoforms Other	0.0%	0	0.0%	7	0.4%	41	0.1%	9	0.2%	9
10 Film, Retail Bags	0.3%	3	1.7%	261	1.6%	166	1.9%	113	2.0%	118
11 Film, Other Bags	0.9%	10	5.5%	837	5.3%	533	6.1%	364	6.5%	378
12 Film, Wrap	3.3%	39	20.5%	3,141	19.9%	1,999	22.8%	1,365	24.6%	1,419
13 Film, Garbage	1.7%	20	10.4%	1,591	10.1%	1,013	11.5%	691	12.4%	719
14a Film, Other	0.4%	5	2.7%	411	2.6%	262	3.0%	179	3.2%	186
14b Film, Other Metalized	0.1%	1	0.4%	69	0.4%	44	0.5%	30	0.5%	31
17a Other Plastic Blister	0.9%	10	0.5%	70	0.3%	35	0.3%	17	0.3%	18
17b Other Plastic All Other	89%	1,033	47%	7,277	36%	3,653	29%	1,727	33%	1,904
Plastics Totals	100%	1,156	100%	15,350	100%	10,064	100%	5,996	100%	5,775
Top 10 materials										



State of Oregon
Department of
Environmental
Quality

Commercial Disposal by Sector, p3: Vermont Applied to Oregon (top 10)

	Recreation		Restaurants		Retail Trade	Retail Trade		Transportation and Warehousing		Wholesale Trade	
Plastics Types	%Plastics	Tons	%Plastics	Tons	%TotDisp	%Plastics	Tons	%Plastics	Tons	%Plastics	Tons
Total Sector Disposal		1,227		85,605			94,470		42,645		25,103
1a #1 PET Bottles EBB	7.7%	15	2.2%	195	0.2%	1.6%	167	2.2%	63	1.1%	36
1b #1 PET Bottles BB	1.5%	3	0.4%	38	0.0%	0.3%	32	0.4%	12	0.2%	7
2 #1PET Food and Dairy Bottles and Jars	3.0%	6	0.8%	75	0.1%	0.6%	64	0.9%	24	0.4%	14
4 HDPE Food and Dairy and Detergent	1.5%	3	6.4%	582	0.3%	2.8%	302	8.6%	242	3.8%	130
5c #3 - 7 Bottles Non	0.3%	1	0.1%	11	0.0%	0.1%	9	0.4%	11	0.0%	1
6b Plastic Cups PP	0.3%	1	0.1%	11	0.0%	0.1%	9	0.4%	11	0.0%	1
6c Plastic Cups PS	0.3%	1	0.1%	11	0.0%	0.1%	9	0.4%	11	0.0%	1
6e Plastic Cups Other	0.3%	1	0.1%	11	0.0%	0.1%	9	0.4%	11	0.0%	1
7b Tubs and Lids PP	1.0%	2	0.4%	36	0.0%	0.3%	28	1.3%	37	0.1%	5
7e Tubs and Lids Other	0.4%	1	0.2%	14	0.0%	0.1%	11	0.5%	14	0.1%	2
8a Bulky Rigid >1 Gallons PE	0.2%	0	0.7%	60	0.0%	0.3%	31	0.9%	25	0.4%	13
8b Bulky Rigid >1 Gallons PP	0.4%	1	0.2%	14	0.0%	0.1%	11	0.5%	14	0.1%	2
8c Bulky Rigid >1 Gallons Other	5.8%	11	2.2%	202	0.2%	1.5%	161	7.5%	211	0.7%	26
9a Thermoforms PET	2.1%	4	0.6%	53	0.0%	0.4%	45	0.6%	17	0.3%	10
9f Thermoforms Other	0.3%	1	0.1%	11	0.0%	0.1%	9	0.4%	11	0.0%	1
10 Film, Retail Bags	1.7%	3	2.2%	201	0.2%	1.6%	166	1.9%	53	2.0%	70
11 Film, Other Bags	5.5%	10	7.1%	644	0.6%	5.0%	534	6.0%	170	6.5%	224
12 Film, Wrap	20.6%	39	26.8%	2,417	2.1%	18.8%	2,005	22.6%	639	24.4%	843
13 Film, Garbage	10.4%	20	13.6%	1,225	1.1%	9.5%	1,016	11.5%	324	12.4%	427
14a Film, Other	2.7%	5	3.5%	317	0.3%	2.5%	263	3.0%	84	3.2%	110
14b Film, Other Metalized	0.4%	1	0.6%	53	0.0%	0.4%	44	0.5%	14	0.5%	18
17a Other Plastic Blister	0.3%	1	0.3%	26	0.1%	0.5%	54	0.2%	7	0.4%	14
17b Other Plastic All Other	31%	59	30%	2,667	5.9%	52%	5,585	25%	719	42%	1,459
Plastics Totals	100%	189	100%	9,032	11%	100%	10,669	100%	2,822	100%	3,450
Top 10 materials											

Committee Feedback and Discussion

- General comments?
- Should initiatives focus on recovering higher quantities of materials already targeted for collection (i.e., improving the effectiveness of existing investments in programs and infrastructure), or should the focus be on expanding the types of plastics collected and marketed?
- What materials/products should be a focus for increased recycling/diversion?
- What residential or commercial and institutional streams should be prioritized for increased recycling?



Markets Overview

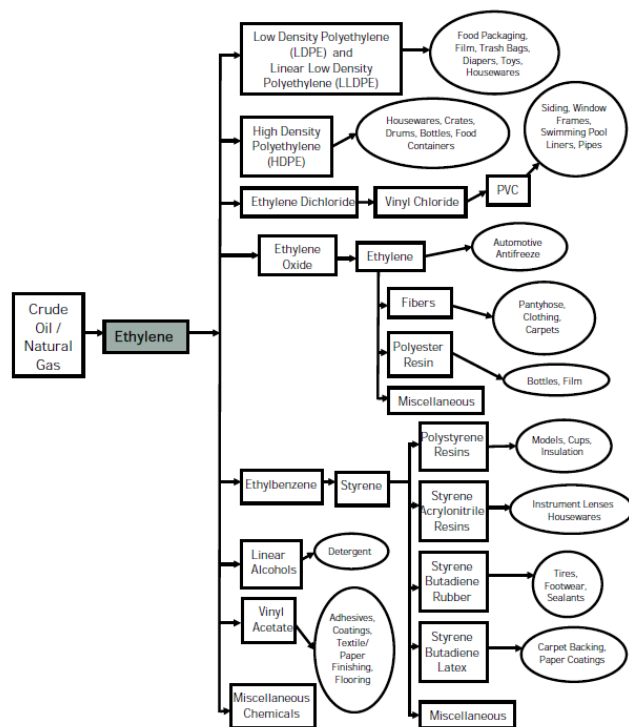
Market Types

- Recycling markets
 - MRFs/handlers/MSW sorting – separate from other materials, sort, remove contaminants, bale
 - Brokers/exporters
 - Plastics recovery facilities (PRF) – sort mixed plastics into market grades, grinds
 - Processors/merchant reclaimers – clean, grind, repelletize, sell recycled resins
 - Product manufacturers – integrated recycling and product manufacturing
- Recovery markets
 - Fuel processors – remove unacceptable materials, shred, blend
 - Solid fuel combustors (cement kilns, electric power plants)
 - Mixed MSW (mass burn waste to energy, gasification)

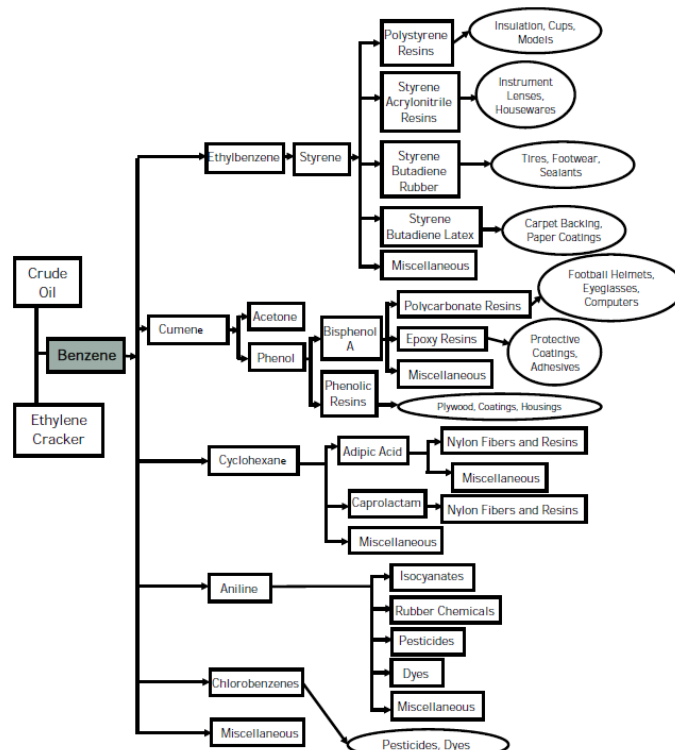
Market Grades

- Plastics generally are incompatible with each other and need to be sorted by resin and grade for highest use

Plastics Derived From Ethylene



Plastics Derived From Benzene



Market Grades

- Rigid Plastics
 - All Rigid Plastics
 - Commingled Bottles
 - Bulky Rigids
 - Pre-picked Rigids (no bulky)
 - PET Bottles
 - PET – Bottles & Thermoforms
 - HDPE bottles – colored & natural
 - HDPE Colored Bottles
 - HDPE Natural Bottles
 - HDPE Colored Bottles & Containers
 - Tubs & Lids
 - PE Injection
 - Polypropylene
 - Engineering Grades (sorted)
- Film Plastics
 - Commercial clear PE film
 - Commercial mixed color PE film
 - Mixed PE film
 - Curbside film
 - Dirty agricultural film
 - Clean agricultural film
 - Other film

Oregon Plastics Recycling Markets

Company	St.	PET	HDPE	PVC	Film	PP	PS	Bulky	Mixed	Eng.	Elect.
Agri-Plas	OR		●		●	●					
Denton	OR		●		●●	●				●	
Northwest Polymers	OR		●	●				●			
ORPET	OR	●									
Epic Plastics	CA		●●			●●					
Merlin	BC		●			●					
Merlin	AB	●									
Peninsula	CA	●									
Trex	NV				●						
Misc. Export		●●	●●	●●	●●	●●	●●	●●	●●	●●	●●

Asian Export Markets

Pre-picked rigids sorting



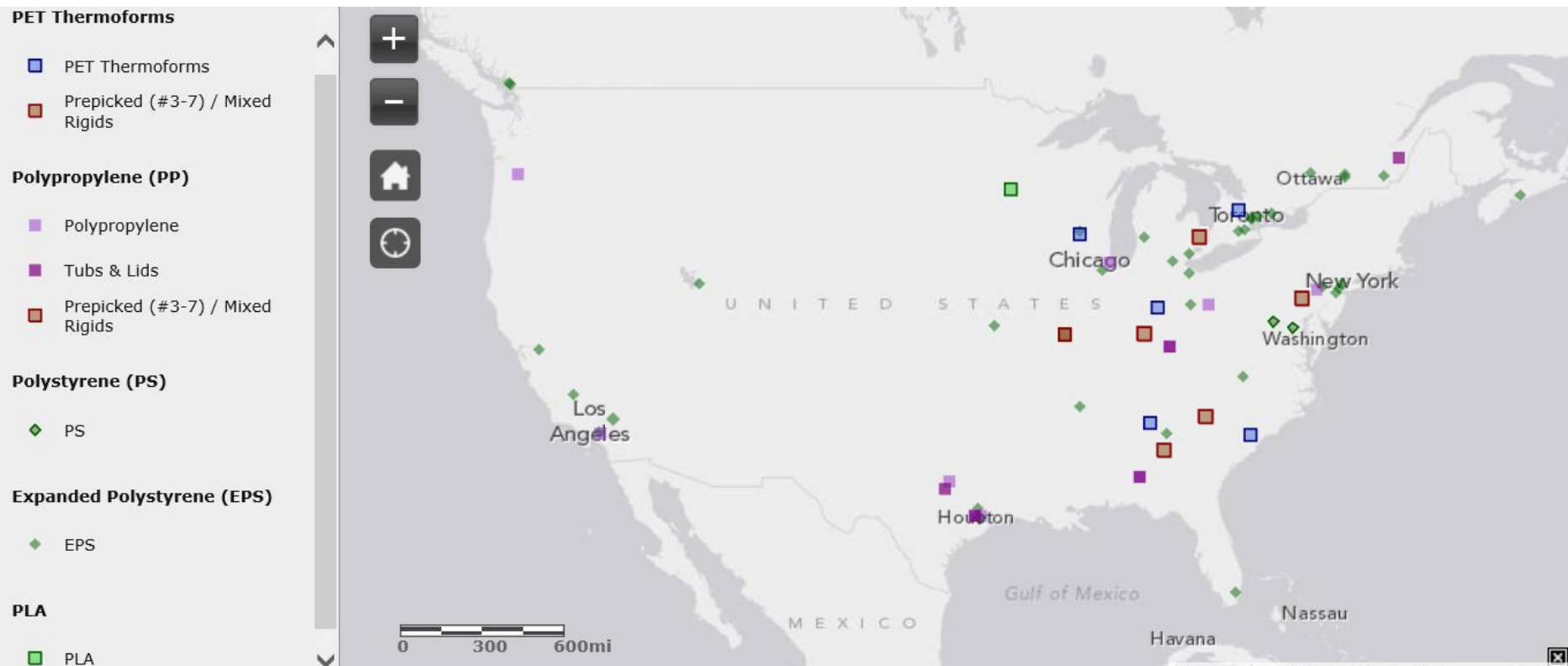
Film inspection, sorting, contaminant removal





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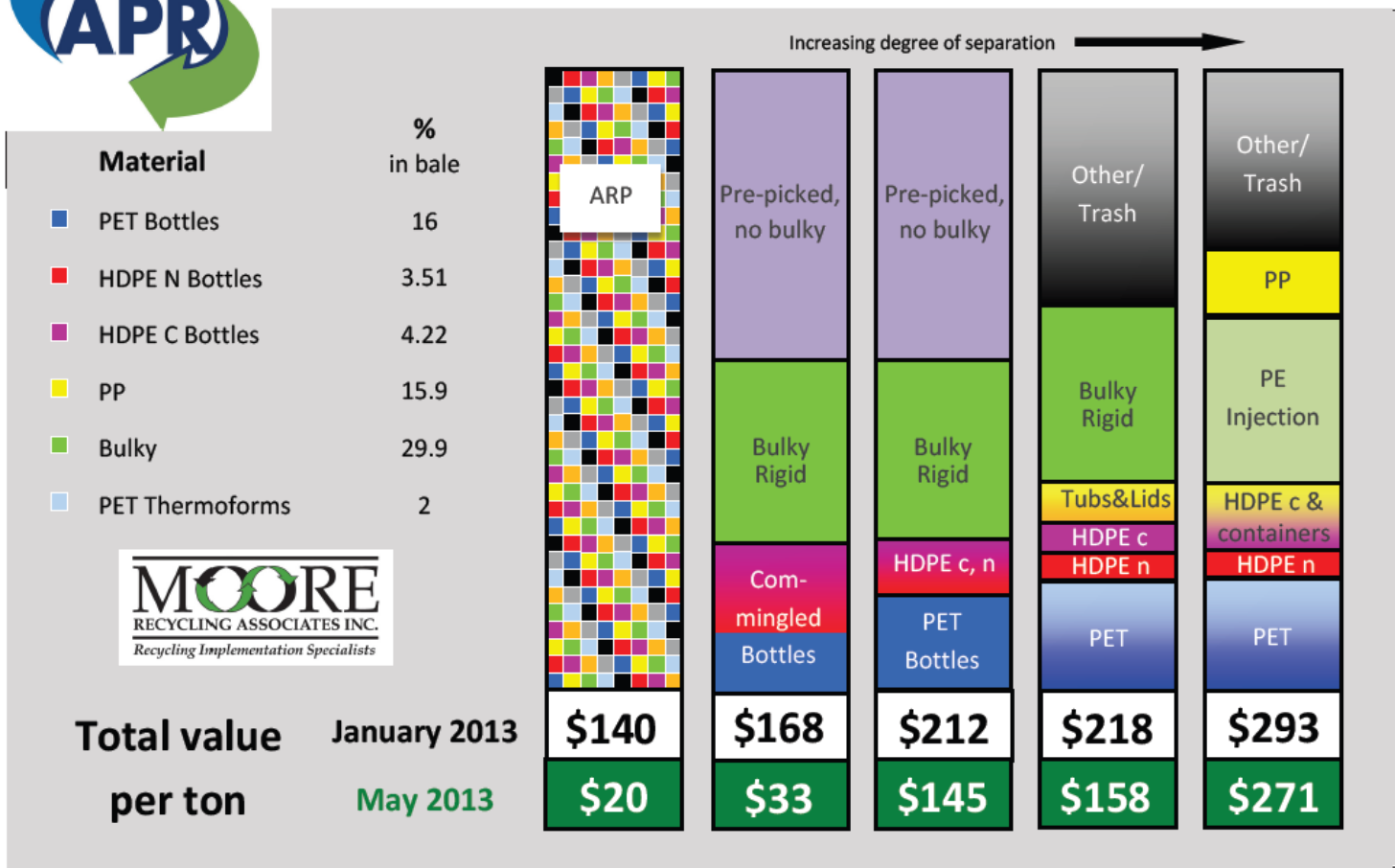
Emerging Recycling Markets



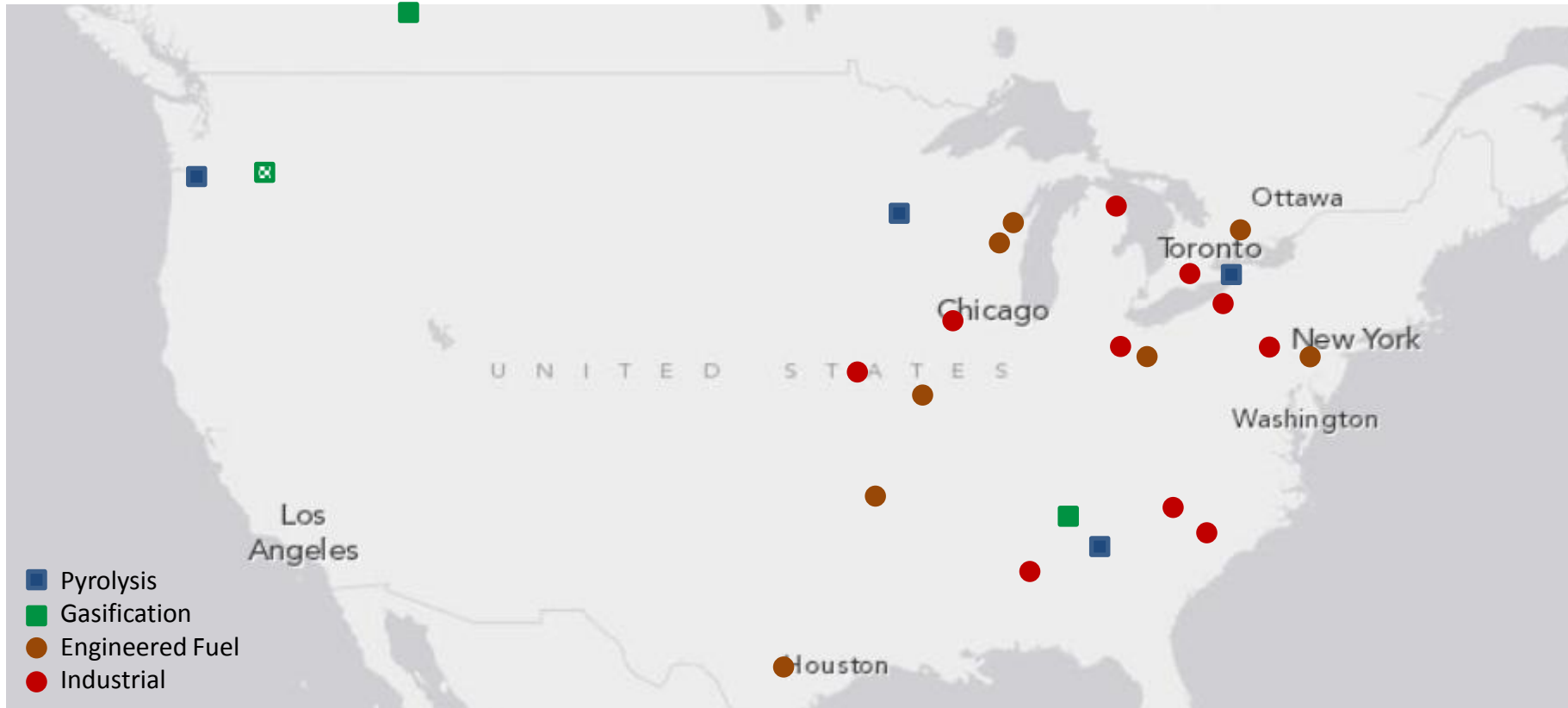
Market Stability Vrs. Sorting



SORT FOR VALUE



Recovery Markets and Technologies



Break

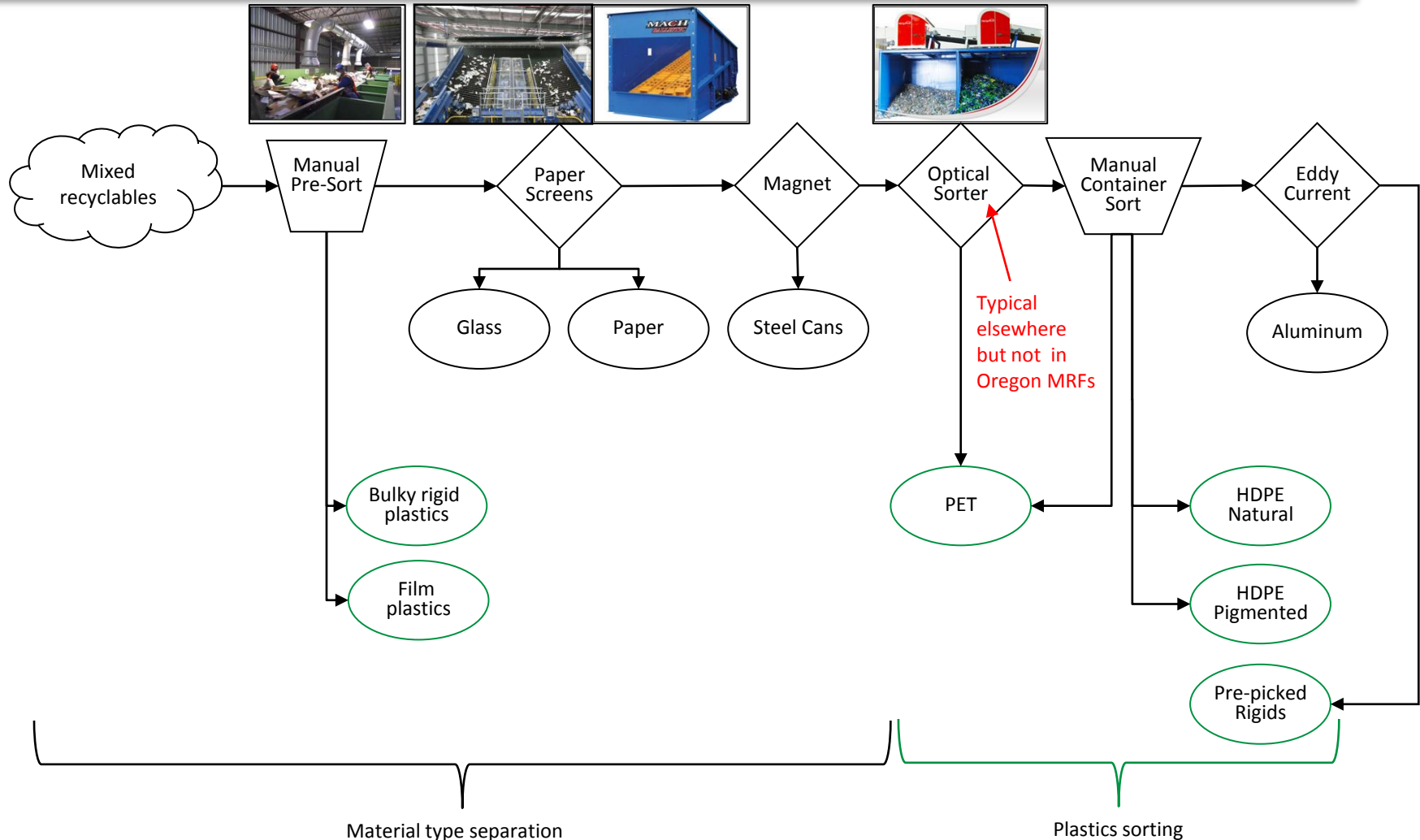
- Enjoy your break! We will resume our meeting in ten minutes.

Sorting Technologies Overview

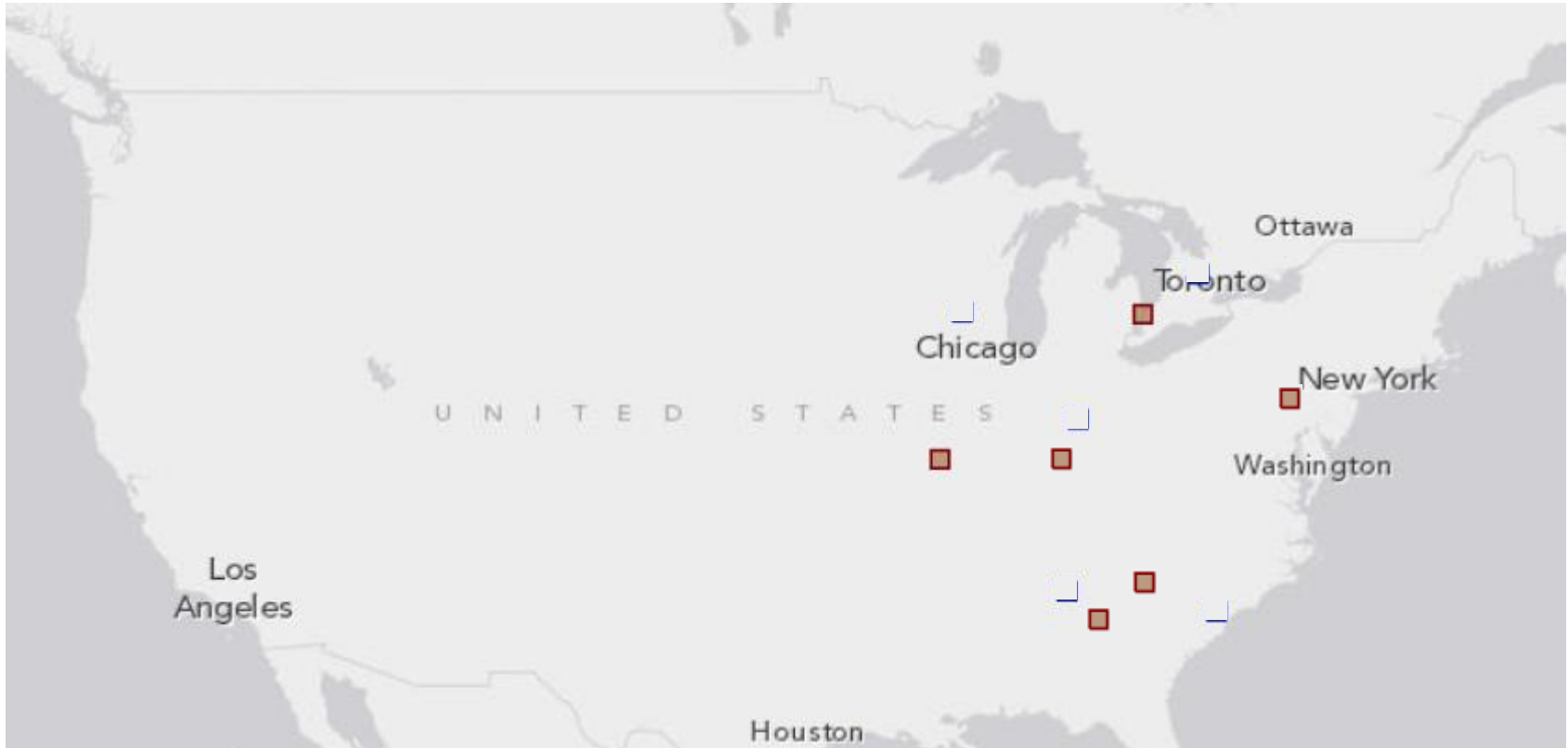
Sorting Technologies Overview

- Technologies to separate plastics from other materials
 - MSW processing, wet/dry processing
 - Metro Enhanced Dry Waste Recovery Program
 - Single-stream technologies
 - Durable/composite products processing
 - Dismantle
 - Shred with advanced separation and sorting technologies
- MRF-level plastics sorting technologies
 - Technologies and limitations
 - Economies of scale and cost considerations

Typical Sorting - Residential Material



Plastics Recovery Facilities



Committee Feedback and Discussion

- General comments?
- Should recycling and/or recovery goals be set for plastics? If so, what should the goals apply to (e.g., should the RPC goal be increased, and if so, what should the goal be)?
- Should other plastics in addition to RPC's and beverage containers have recycling goals?
- What should be the role of the state in plastics market development?
- Should certain plastics be a focus point for market development (e.g., California's investment in PET market development)?
- To what degree should plastics be sorted locally versus sent to a PRF or to export?

Concluding Questions, Wrap-up, and Next Steps

Concluding Questions

- What functional categories of plastics should be investigated in more detail before the next Workgroup meeting?
 - What specific information or outstanding questions about these categories needs to be addressed?
- What collection and processing systems should be more fully investigated before the next meeting?
 - What specific information or outstanding questions about these systems needs to be addressed?
- What is the appropriate place for energy recovery technologies for plastics?
- What is your vision for the future state of plastics recycling and recovery in Oregon

Wrap-Up and Next Steps

- What we heard
- Where more information/investigation is needed
- Next steps
- Next Workgroup meeting – latter half of June

THANK YOU FOR YOUR TIME!

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