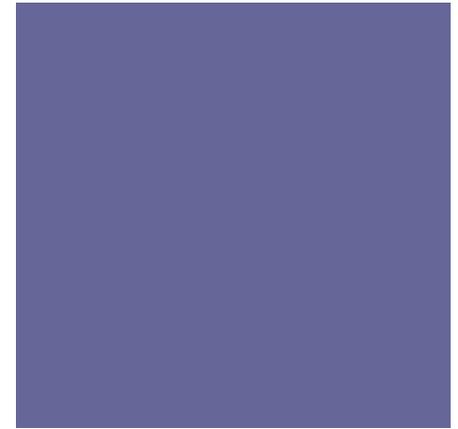




# Plastic Recycling & MRF's



## WA Commingled Project

Patty Moore  
Moore Recycling

# + Overview

## Materials

- PET
- HDPE
- Next Month (?)
  - Film
  - Non-bottle Rigid Plastic

## Topics

- Prohibitives? Methods to track?
- Outhrows? Methods to track?
- Yield loss?
- Problems with your equipment?
- Value (environmental and economic) in using vs. other virgin feedstock?
- Final product?

# + PET: Prohibitives

- Non-PET
  - Glass
  - Aluminum
  - Paper
  - Other plastic (film, PVC, PLA, etc...)
  - Metal
  - Degradable Plastic
  - Rocks, mud, dirt, oil, grease
  - Industrial scrap bottles
  - Free flowing liquids
  - Wood, hazardous materials

# + PET: Outhrows

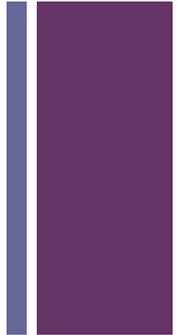
- Barrier bottles
- Full-Wrap Label bottles
- Thermoforms





# PET: Yield Loss

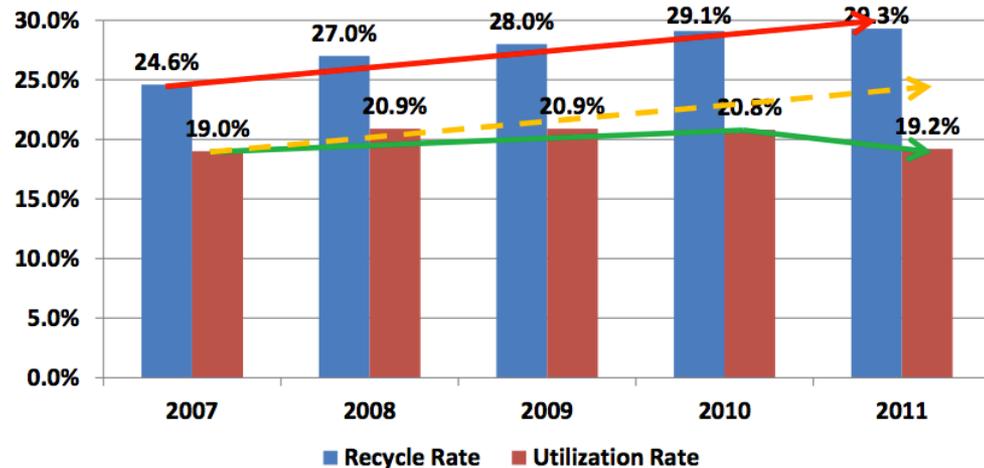
- United States reclaimers reported yield losses ranging from 25% for deposit bottles to 35% for curbside material
- Contamination levels are higher in all categories than in 2010 and **have reached crisis levels according to industry experts**



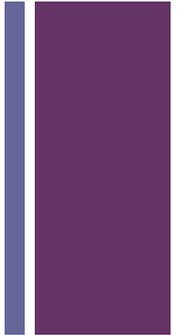
## PET Recycling Rate and Utilization Rate in U.S.

Source: United States National Postconsumer Plastics Bottle Recycling Report

Utilization Rate = Yield of Recycled Flakes/Resins Produced by Recyclers



# + PET: Equipment Issues

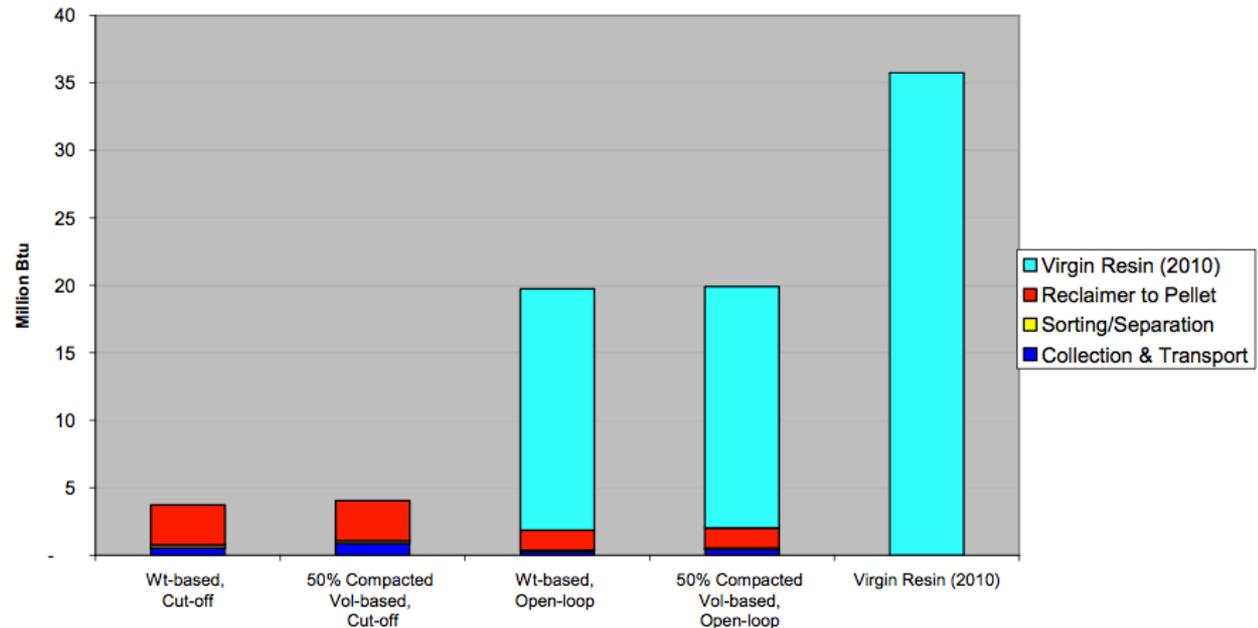


- NIR Identification Problems
- Grinder Wear
- Low Melts
- Label Separation
- Bleeding Labels
- Fish Eyes – Black Specs
- Loss of Clarity and Yellowing
- Extruder Drool or Drip

# + PET: Value vs Virgin

- For a single pound of recycled PET flake, the energy use required over virgin is reduced by 84%; the GHG emissions, by 71%

Figure 3-2a. Energy Results by Life Cycle Stage for Production of Recycled HDPE Resin Pellet (million Btu per 1,000 pounds of resin)



Cut-off method: Full burdens for collection, sorting, and reprocessing; no virgin resin burdens  
 Open-loop method: Half burdens for virgin resin production, collection, sorting, and reprocessing.

# + PET: Final Product

- Fiber
- Food & Beverage Bottles
- Sheet & Film
- Strapping
- Non-Food Bottles
- Engineered Resin & Other



# + HDPE: Prohibitives

- Non-HDPE
  - Glass
  - Aluminum
  - Paper
  - Other plastic (film, PVC, PLA, etc...)
  - Metal
  - Degradable Plastic
  - Rocks, mud, dirt, oil, grease
  - Industrial scrap bottles
  - Free flowing liquids
  - Wood, hazardous materials

# + HDPE: Outhrows

- Calcium Carbonate Loaded
- PP Bottles
- Colored PET Bottles
- Injection Grade HDPE



# + HDPE: Yield Loss

- Natural Homopolymer = 80+ %
- Colored Copolymer = 65% - 70%



# + HDPE: Equipment Issues

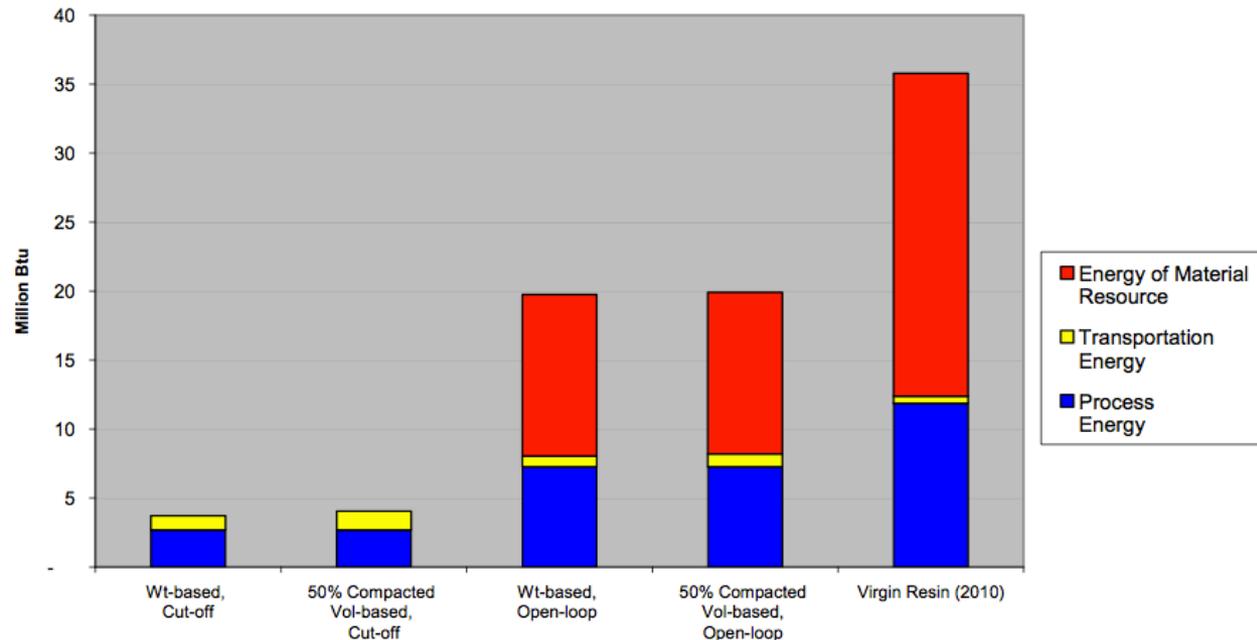


- NIR Identification Problems
- Grinder wear
- Label Separation
- Bleeding Labels
- Sinking Materail

# + HDPE: Value vs Virgin

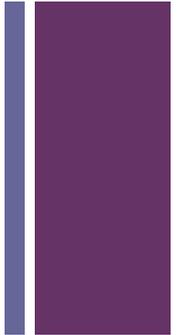
- Recycled resin uses 90% less energy and emits 78% less greenhouse gases than virgin resin

Figure 3-2b. Energy Results by Energy Category for Production of Recycled HDPE Resin Pellet (million Btu per 1,000 pounds of resin)



Cut-off method: Full burdens for collection, sorting, and reprocessing; no virgin resin burdens  
Open-loop method: Half burdens for virgin resin production, collection, sorting, and reprocessing.

# + HDPE: Final Product



- Non-Food Bottles
- Pipe
- Lumber / RR Ties
- Film / Sheet
- Automotive
- Lawn & Garden
- Buckets / Crates / Pails
- Other

