Recycling Mining Tires

The Monster OTR’s that Challenge Today’s Tire Processors
2018 OTR Conference
Sawgrass Marriott

OTR Recycling Update

The Challenge continues…….
The “End of Life” OTR (US Market)

• OTR’s represent just 1% of the tire industry in unit volume, but 15 to 20% in total weight.
• The challenge continues for our industry to manage this tire flow to recover and recycle the significant volume of high quality rubber and the tons of high carbon steel found in these BIG LUGS.
• As an Industry, we must become more responsible for improving the recovery of these valuable resources!!!
Stockpiled Mining Tires – Real World

Storage
Logistics
Contamination
Degradation
Why Recycle? (What’s in the tire)

- **Ontario Tire Stewardship Off the Road Yield Study by Envise**
- Material Yields from OTR’s Vary
  - Rubber: 43-71% (giant OTRs are high rubber)
  - Steel: 9-57% (industrial tire category is high steel)
  - Fabric: 0-32% (Ag and large OTRs are high fabric, giant OTRs are zero fiber)
- Depends on the exact OTR
Approach to Processing Mining Tires

- Market – Front End Supply
- Logistics
- Capacity
- Capital Investment
- Operating Costs
- Market – Back End Demand
Bead Removal for Steel Recovery

• *The OTR bead is made of high carbon steel*

• *Modern equipment removes the bead leaving a 95% clean steel material.*

• *Today’s market for clean wire is about $125/ton*

• *Giant OTR’s yields about 500 pounds of wire*
The hydraulic system can pull the bead bundles “clean” from tires with a 25” rim opening as well as up to 63” radial tires.
Brief Update from Canada

**OTR tires represent about 15% of Canada’s tire volume by weight:**

- **Alberta:**
  - Ft. McMurray - Green Carbon (Thermal Vacuum Process)
  - Edmonton – Liberty Tire Recycling
    Shears into smaller 250lbs. sections, then shreds into TDF, TDA, small amount of mulch

- **British Columbia:**
  - Vancouver – Liberty Tire Recycling
    Shears and shreds into TDA, mulch, crumb and ballistic material. OTR processing is expanding.
Green Carbon – Titan Tire
Ft. McMurray Update

• A September fire in one thermal vacuum reactor caused a plant shutdown. Although the plant is now operational, production slowed.

• Located near the Alberta tar sands, the plant provides a valuable solution for managing the flow of scrap tires generated.
A closer look at......
Thermal Vacuum Process
FT. McMurray, Alberta
Titan Tire Reclamation Corp.

• Reactor separates oil, carbon black, steel, gas

According to Titan, a 59.00R63” mining tire yields:
• 500 gallons of renewable blend oil
• 4000 pounds of carbon black
• 2000 pounds of steel
• 3,267,333 cu. ft. of syn gas (which provides energy to run the reclamation system)
The Challenge in Chile continues

- 30,000 scrap OTR’s in inventory need processing
  - The steel in these tires alone have a value of nearly $1M

- Chilean processors have purchased equipment in the past to remove the bead, bagel cut and section the tires.

- Processors are also examining the pyrolysis process to capture the raw material.

Programs are on hold pending implementation of Chilean Law No. 20.929
What is Chilean Law No. 20.920

Law of Waste Management, Extended Producer Responsibility and Promotion of Recycling!!!!

Although enacted in May 2016, implementation meetings are just now being held to establish goals for collection and recovery. EPR is intended to provide a circular recycling model for waste management by creating a system where the producers or importers are responsible for organizing and financing waste management.

Products to manage include processing oils, electronics, cells, packaging, TIRES and batteries.
More on Chile and EPR

- According to Daniel Rojas Enos, the General Director of ARNEC, (the Chilean Retreading Organization) many recycling projects are on hold, pending the implementation of the EPR program.

- *If you are a manufacturer or importer of OTR tires, an EPR program puts all responsibility-financial, operational, reporting, all-of-it on you!*

- *EPR is also under consideration in other Latin American Countries.*
An Update from Australia

• We reported last year that Tytec and Green Distillation Technologies (GDT) formed a partnership to open an OTR recycling plant in Perth. That plant scheduled for 2017 is now planning a June 2018 opening.

• The plant will recycle whole OTR’s, using GDT’s “destructive distillation process”.

• The recycling center will have a capacity of 5000 tons of OTR tires per year, yielding over 2 million liters of oil, 2000 tons of carbon black and 1000 tons of steel.

• It is estimated that Australia generates about 155,000 tons of scrap OTR/yr. Since 80% are currently left on site, this plant is a welcome addition.
Anything new in South Africa?

• *The contracted tire recycler in South Africa is Redisa, an operation with ties to the government.*

• We know Redisa has purchased OTR processing equipment that removes the bead and downsizes the tire into sections.

• The current market for downsized OTR’s is tire derived fuel which is used to produce electricity.

• We understand that Redisa is also looking seriously at acquiring some form of pyrolysis system
Pyrolysis appears to be a common theme

• **OTR tire recyclers in Canada, Latin America, Australia and South Africa are either using a form of pyrolysis or seriously considering the pyrolysis technology to recycle OTR tires.**

• **So what is it?** *a technique which heats whole or shredded tires in a reactor vessel containing an oxygen free atmosphere. In the reactor, the rubber is softened after which the rubber polymers break down into smaller molecules of the original components, producing oil, gas and char (carbon black filler). The minerals that were part of the tire are removed as solid ash.*

• **Pyrolysis technology is also found in the US and Europe. The potential to recycle OTR tires using pyrolysis technology on a global basis is certainly under evaluation.**
Recyclers today are managing OTR’s in many valuable ways:

- OTR’s become dock bumpers, wear pads, livestock water tanks, bale feeders, feed bunkers and ballistics chips for gunnery ranges.
- Additionally, processors are using the rubber as fuel, civil engineering chips, rubber asphalt roads and landscaping.

These well established markets are valuable to the recycling industry.

**However, if we are going to increase the level of OTR recycling; we must stop stockpiling and burying.**

*Investments in processing equipment, technologies and markets are necessary.*
We *Can* and We *Must* do better than this!

Far too many OTR’s are found in vacant desert lots along major highways, while others are buried or abandoned in mines.