RMA Scrap Tire Activities

• RMA is the association that represents the 8 US based tire manufacturers
• Scrap tire activities began in 1990
• Scrap Tire Management Council = RMA
• RMA works with governments, scrap tire users, NGO’s, general public to accomplish mission
RMA Tire Company Members

BRIDGESTONE AMERICAS

COOPER TIRES

MICHELIN

TOYO TIRES

CONTINENTAL Tires Engineered in Germany

GOOD YEAR

PIRELLI

YOKOHAMA
The Scrap Tire Industry

- Began in 1985 w/first state tire program
- Industry began as a ‘mama/papa’ industry
- From 1979 – 1992 TDF was the only market for scrap tires
- In 1992 scrap tires first used as TDA
- In 1992 scrap tires first used as ground rubber
The Scrap Tire Industry

- Percentage of tires to markets has increased annually
- TDF remains the largest market & serves as the base market for the industry
- Markets for ground rubber have developed slowly
- Markets for TDA expanded until 2003; impacted by demand for TDF & GR
U.S. Scrap Tire Management Trends, 1990 - 2005


Utilized (millions) vs. Generated (millions) with percentage utilization.
The Scrap Tire Industry

- Industry has consolidated into large, regionally based companies
- Scrap tire industry is driven by “demand/pull” forces
- Collection/processing of tires is important, but not most critical aspect of the industry
- Markets are the most critical factor
The Scrap Tire Industry

• State programs/policies have major impact
• Numerous companies have failed
• Large investments do not guarantee success
• Markets are regional and vary by region
• Need for a 3-to-5 year plan
US Scrap Tire Market Overview

- From 2005 to 2007 demand for TDP increased by 5%
- Nearly 87% of annually generated tires went to end-use markets
- TDF remains largest single market
- Demand for ground rubber increased
- TDA usage decreased significantly

• TDF market expanded 20%
• GR market expanded 46%
• CE market contracted 13%
• Loss of punched/stamped products
• Other markets are not significant
<table>
<thead>
<tr>
<th>Market</th>
<th>2005</th>
<th>2007</th>
<th>% change</th>
</tr>
</thead>
<tbody>
<tr>
<td>Tire-Derived Fuel</td>
<td>2144.6</td>
<td>2486.4</td>
<td>15.9%</td>
</tr>
<tr>
<td>Cement Kilns</td>
<td>802.0</td>
<td>664.0</td>
<td>-17.2%</td>
</tr>
<tr>
<td>Pulp &amp; Paper</td>
<td>539.3</td>
<td>1075.5</td>
<td>99.4%</td>
</tr>
<tr>
<td>Electric Utilities</td>
<td>373.3</td>
<td>341.5</td>
<td>-8.5%</td>
</tr>
<tr>
<td>Industrial Boilers</td>
<td>290.4</td>
<td>201.5</td>
<td>-30.6%</td>
</tr>
<tr>
<td>Dedicated TTE</td>
<td>138.3</td>
<td>203.5</td>
<td>47.1%</td>
</tr>
<tr>
<td>Lime Kilns</td>
<td>not avail.</td>
<td>0.4</td>
<td>n/a</td>
</tr>
<tr>
<td>Ground Rubber</td>
<td>552.5</td>
<td>807.5</td>
<td>46.2%</td>
</tr>
<tr>
<td>Civil Engineering</td>
<td>640.0</td>
<td>560.0</td>
<td>-12.5%</td>
</tr>
<tr>
<td>Electric Arc Furnace</td>
<td>18.9</td>
<td>27.1</td>
<td>43.8%</td>
</tr>
<tr>
<td>Exported</td>
<td>112.0</td>
<td>102.1</td>
<td>-8.8%</td>
</tr>
<tr>
<td>Agricultural</td>
<td>47.6</td>
<td>5.5</td>
<td>-88.4%</td>
</tr>
<tr>
<td>Punched/ Stamped</td>
<td>100.5</td>
<td>1.9</td>
<td>-98.2%</td>
</tr>
<tr>
<td>Total to Market</td>
<td>3616.1</td>
<td>3990.5</td>
<td>10.4%</td>
</tr>
<tr>
<td>Landfilled</td>
<td>590.8</td>
<td>730.1</td>
<td>23.6%</td>
</tr>
<tr>
<td>Baleed</td>
<td>42.2</td>
<td>38.1</td>
<td>-9.8%</td>
</tr>
<tr>
<td>Generated</td>
<td>4410.7</td>
<td>4612.4</td>
<td>4.6%</td>
</tr>
<tr>
<td>% to Market/Utilized</td>
<td>82.0%</td>
<td>86.5%</td>
<td>5.5%</td>
</tr>
<tr>
<td>% Managed (incl. Baleed and Landfill)</td>
<td>96.3%</td>
<td>103.2%</td>
<td>6.8%</td>
</tr>
</tbody>
</table>
U.S. Scrap Tire Disposition, 2007

- Tire-Derived Fuel: 52.3%
- Landfilled: 15.3%
- Baled: 0.8%
- Punched/Stamped: 0.0%
- Exported: 2.1%
- Civil Engineering: 11.8%
- Ground Rubber: 17.0%
- Electric Arc Furnace: 0.6%
Tire-Derived Fuel

- Shift in demand to PPMs
- Cement kilns using fewer tires
- Value of TDF has increased dramatically
- Quality of fuel chip has improved
- Demand for TDF expected to increase
Ground Rubber Markets

- Rubber modified asphalt
- Infill material in artificial athletic fields
- Cover material under playgrounds
- Molded/Extruded products
- Mulch
- Bound rubber products
Rubber Modified Asphalt

- Little market growth over last 4 years
- Major markets limited to 5 states
- Not usable on all types of roads
- Need to work with public sector & contractors
- Technology still not well understood
- Best of quiet road surfacing: some potential for increased use
Ground Rubber in Sport Surfacing

- Fastest growing market niche for GR
- 2009 market demand appears strong
- High end market requires strong economy
- Questions on health impacts linger
- Outlook for 2010 in question
Ground Rubber in Playgrounds

- Strong market: safest material to fall onto
- Concerns raised about volatile emissions; “latex”; leachate; ADA requirements and ingesting rubber chips being addressed
- Facing strong competition from traditional cover materials
- 2009/2010 demand likely to decrease
Molded & Extruded Products

- Increased/increasing use in molded & extruded products
- Large potential market but many technical issues have to be addressed
- Focus of several state & industry programs
  - CA & NY
  - RMA & Clemson University
Mulch

- Demand has been increasing over last 4 years
- Replaced wood chips, which are being used for fuel value in PPMs
- Has become well accepted in marketplace
- Continued demand a function of the economy
Bound Rubber Products

• Slightly improved demand over last few years
• High end products; requires strong economy
• Demand likely to continue to expand unless economy continues to worsen
Ground Rubber

• Several new, large-scale players coming on-line that can make ultra-fine material
• Production capacity/efficiency does not guarantee markets
• Markets are price/quality sensitive
• Prices are not elastic and cutting price for entry into a market only hurts the industry
Ground Rubber

- Applications for GR exist: time lag between introduction of product & acceptance by public
- Economy-of-scale becomes critical in GR production
- Developing multiple GR markets has its advantages, but increases initial costs
Tire-Derived Aggregate

- Defined as the use of tires shreds in lieu of conventional construction materials
- Lost market share to TDF & GR
- TDF & GR have better return on investment than TDA
- Demand appears to now be stable
- Demand could improve over time
TDA

• Another large-scale end use for tires
• Key to market development is to work with public sector engineers & policy makers
• Education of engineering students also important
• Several states now focusing on this market
Other Technologies

• Devulcanization
  – Breaking the carbon:sulfur bonds
  – Failed 8 years ago; success is questionable

• Pyrolysis/Microwave
  – Yields oil-like material & carbon char
  – Has always failed to be viable
  – Likely to continue to be drain on investments
Fundamentals for Success

- Adequate supply (1.5 – 3 million/yr)
- Markets equal to your supply
- Efficient collection & handling of tires
- Proper equipment & maintenance
- Understanding your costs
- Continued improvements/efficiencies
- Diversified/expanding markets
US Exports of TDPs

• Not well tracked by states

• China
  – 2006—2008 container shipments of TDF from West Coast
  – 2009 shipments have slowed due to economic conditions

• Pacific Rim
  – Same market conditions 2006 -- 2009
Expected Trends: 2009-2010

- TDF markets to further expand
- TDA market will be stable
- Coarse rubber markets to expand
- Ground rubber markets to slowly increase
- States might increase tire fee and use part of the funds for non-tire projects
Conclusions

• Scrap tire industry will continue to mature
• Markets will remain based on local conditions
• Investments must be focused on market oriented activities
• Pressure/competition on markets will continue
• Opportunities/risks remain
RMA Contact Information

Rubber Manufacturers Association
1400 K Street, N.W., Suite 900
Washington, DC  20005
(202) 682-4882
michael@rma.org

Download the Full RMA Scrap Tire Market Report at:
http://www.rma.org/scrap_tires/