

The Sustainable Materials Management Webinar Series

Recycled Rubber Industry Update

Tuesday March 18, 2014/1:30 – 2:45PM ET

Presenter:

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SCRAP TIRE MARKETS

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Understanding the Scrap Tire Marketplace

- Scrap tire markets are demand pull
- Not supply side driven
- Supply is usually not the limiting factor
- Processing tires is not recycling tires
- Different specs for different markets
- Having multiple markets is both possible & necessary

Quick History of U.S. Scrap Tire Management

1985

Minnesota was the first state to enact scrap tire legislation and regulations

1988-1989

- National focus on recycling – Congress considering laws on secondary materials including tires

1990

- 48 states had scrap tire laws or regulations of some kind
- 1990: 11% of scrap tires went to end-use market (TDF)
- EPA stated there were 2-3 billion tires in stockpiles in the US
- RMA formed Scrap Tire Management Counsel to promote scrap tire markets

Today

- Congressional interest has long since waned
- RMA recognized as leading source of information on all scrap tire issues
- Scrap tire markets have increased to over 80% of scrap tires generated
- Over 90% of all stockpiles have been abated
- RMA leadership continues



End Use Markets

- Tire-derived fuel
- Ground rubber
- Tire-derived aggregate
- Material recovery



Tire-Derived Fuel

- Cement kilns
- Pulp & paper mill boilers
- Utility boilers
- Industrial boilers
- Dedicated scrap tire-to-energy
- Blast furnaces
- Resource recovery facilities



Tire-Derived Fuel

- Combustion emissions w/in all limits
- Widely accepted supplemental fuel
- Considered a fuel by EPA
- Cost competitive fuel
- Tire chip quality improving (-1.5 inch)
- Major market for abatement tires



Tire-Derived Aggregate

- Defined as: Use of tires (shreds) in lieu of conventional construction materials
 - Sand / Clean fill / Rock
- Four general uses:
 - Road construction
 - Landfill construction
 - Septic field drainage medium
 - Vibration dampening (light rail)



Civil Engineering Applications

CONSTRUCTION

- Light-weight backfill
- Road embankments
- Road base
- Septic field medium
- Basement insulation

IN LANDFILLS

- Leachate liners
- Gas venting backfill
- Operational liners
- Cap closure material
- Alternative daily cover



TDA

- Given supply/economics of conventional aggregate, TDA use has competitive advantage in 5 applications
 - Light weight fill
 - Septic field drainage medium
 - Vibration dampening
 - Landfill applications
 - Road base (unpaved roads)



Civil Engineering Applications

- Tire Bales
 - Began in mid 1980's
 - Used in Southwest USA (NM/TX)
- Tire baling is not recycling: not good or bad: it's a form of tire processing
- Regulatory agencies looking for "engineered" projects (P.E. stamp)



Ground Rubber (crumb)

- Four general size classifications
 - Buffings
 - Coarse rubber 1/2" - 4 mesh
 - Ground rubber 10 – 40 mesh
 - Fine grind rubber 80 – 400 mesh
- Different markets for different sizes



Ground Rubber

- Tire Buffings
 - Asphalt
 - Bound rubber products (mats)
- Coarse Rubber
 - Playground cover
 - Running tracks
 - Soil Amendments
 - Mulch



Ground Rubber

- Ground Rubber
 - Asphalt
 - Molded/extruded products
 - Infill
- Fine Grind Rubber
 - Tires
 - Rubber/plastic compounds



Material Recovery

- Electric Arc Furnaces (EAFs)
 - Carbon recycling
 - Steel recycling
 - Energy recovery

U.S. Scrap Tire Generation 2011

Tire Class	Millions of Tires	Market Percentage	Average Weight (lbs)	Weight (tons ³)
Light Duty Tires	237.8	89.5%	22.5	2675.1
Passenger tire replacements ¹	194.4	73.1%		
Light truck tire replacements ¹	28.6	10.8%		
Tires from scrapped Cars ²	14.8	5.6%		
Commercial Tires	28.0	10.5%	120.0	1680.9
Medium, wide base, heavy truck replacement tires ¹	16.5	6.2%		
Tires from scrapped trucks and buses ²	11.5	4.3%		
Total tires hauled	265.8	100.0%	32.8	4356.0
Used tires culled	35.1	13.2%	32.8	575.0
Net scrap tires	230.7	86.8%	32.8	3781.0

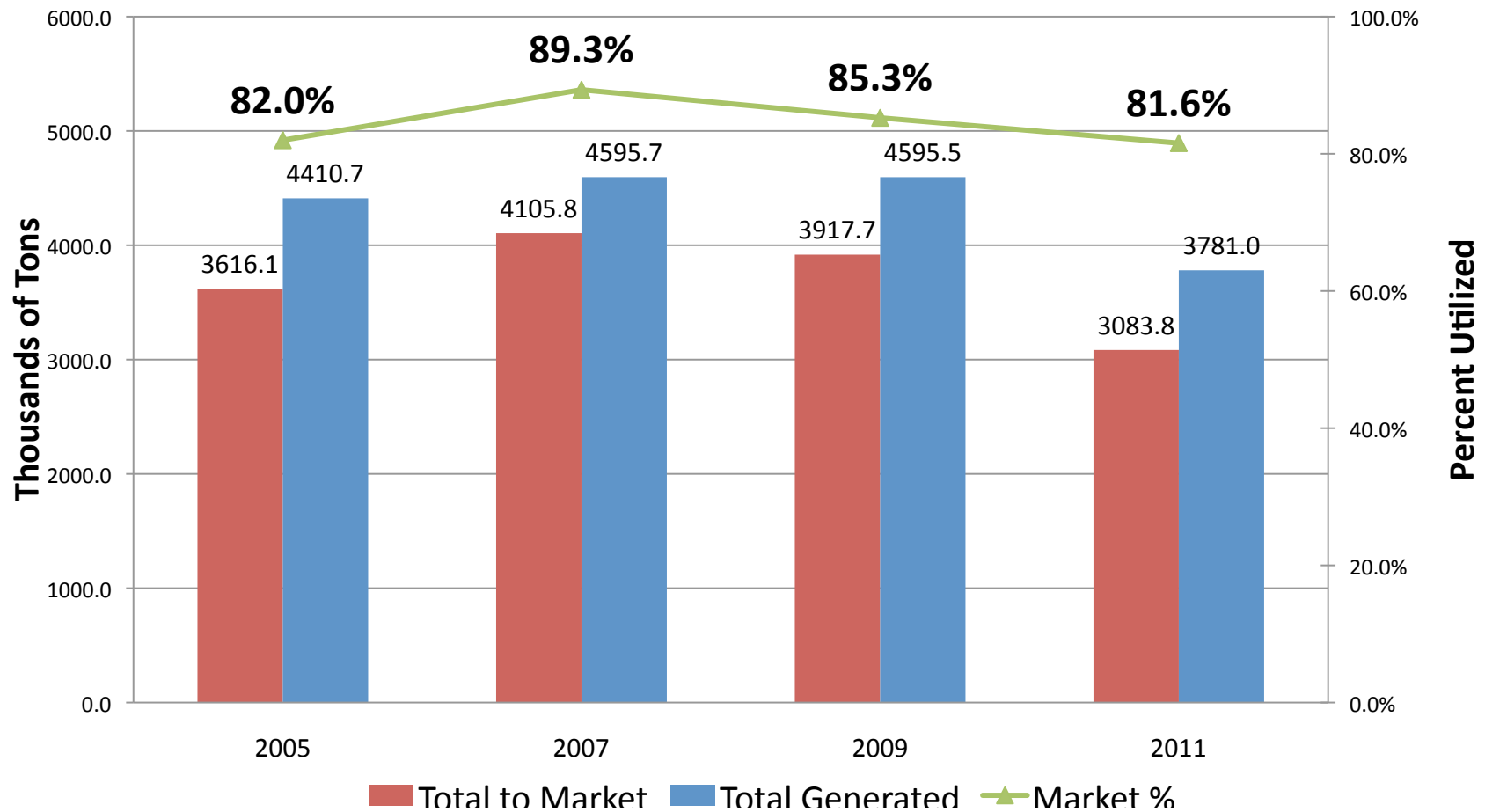
¹Factbook 2012: U.S. Tire Shipment/Activity Report for Statistical Year 2011, Rubber Manufacturers Association.

² Ward's Motor Vehicle Facts and Figures, 2012. Includes the number of vehicles removed from service in the car/light truck, truck and bus categories in 2011. Assumes two tires scrapped from light duty vehicles and 2.5 tires scrapped from trucks and buses.

U.S. Scrap Tire Disposition 2011

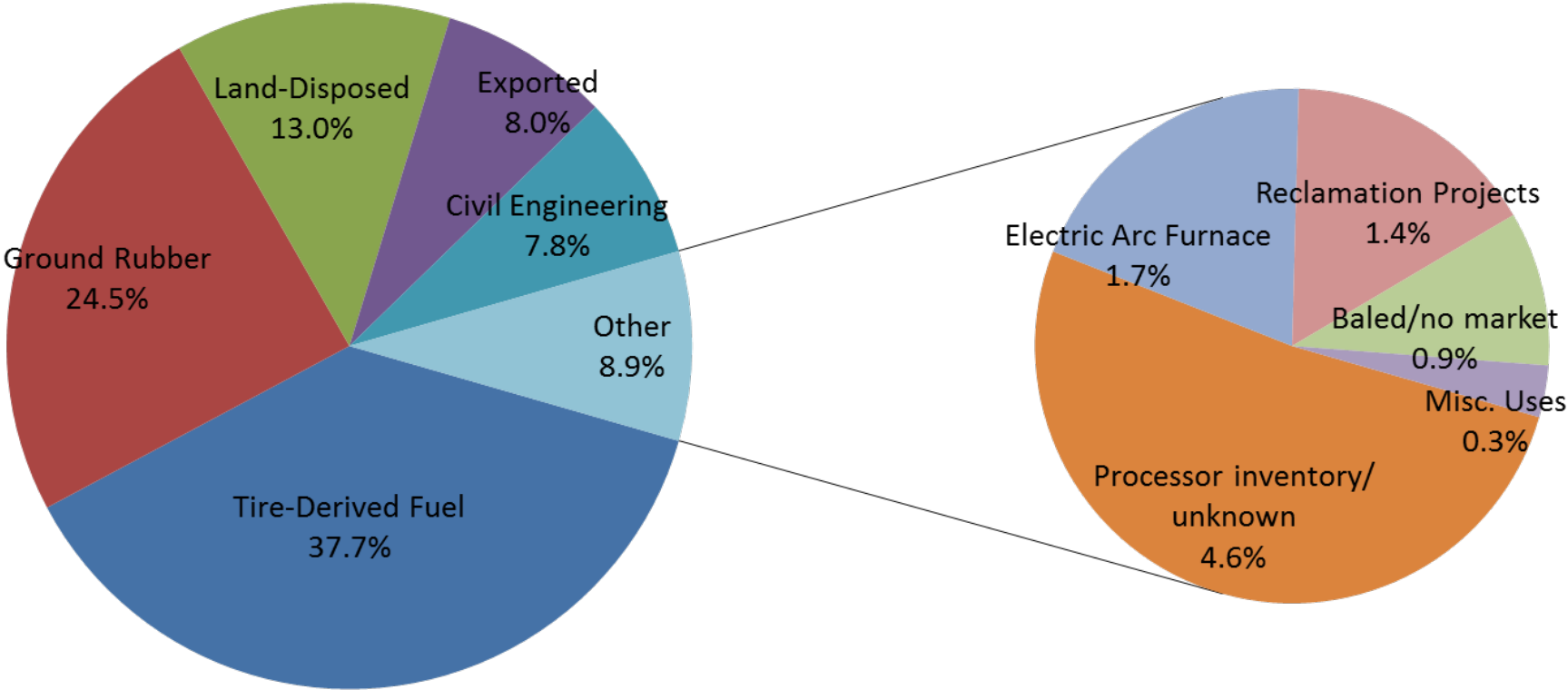
Market of Disposition	Thousands of Tons	Millions of Tires	% change 2009-2011
Tire-Derived Fuel	1427.03	87.08	-31.5%
Ground Rubber	928.50	56.66	-20.2%
Civil Engineering	294.99	18.00	3.5%
Exported	302.48	18.46	196.3%
Electric Arc Furnace	65.55	4.00	141.9%
Reclamation Projects	54.29	3.31	-58.2%
Agricultural	7.10	0.43	0.0%
Baled Tires/market	1.92	0.12	0.0%
Punched/ Stamped	1.90	0.12	0.0%
Total to Market	3235.89	197.45	-17.4%
Generated	3781.03	230.72	-17.7%
% to Market/Utilized	81.6%	81.6%	N/A
Land Disposed	491.65	30.00	-24.8%
Baled/no market	32.78	2.00	110.5%
% Managed (includes Markets, Baled and Landfill)	95.4%	95.4%	N/A
Processor Inventory/Unknown	4.6%	4.6%	N/A

U.S. Scrap Tire Trends 2005 - 2011



U.S. Scrap Tire Disposition 2011*

(percent of total tons generated annually)



* Numbers may not add due to rounding.

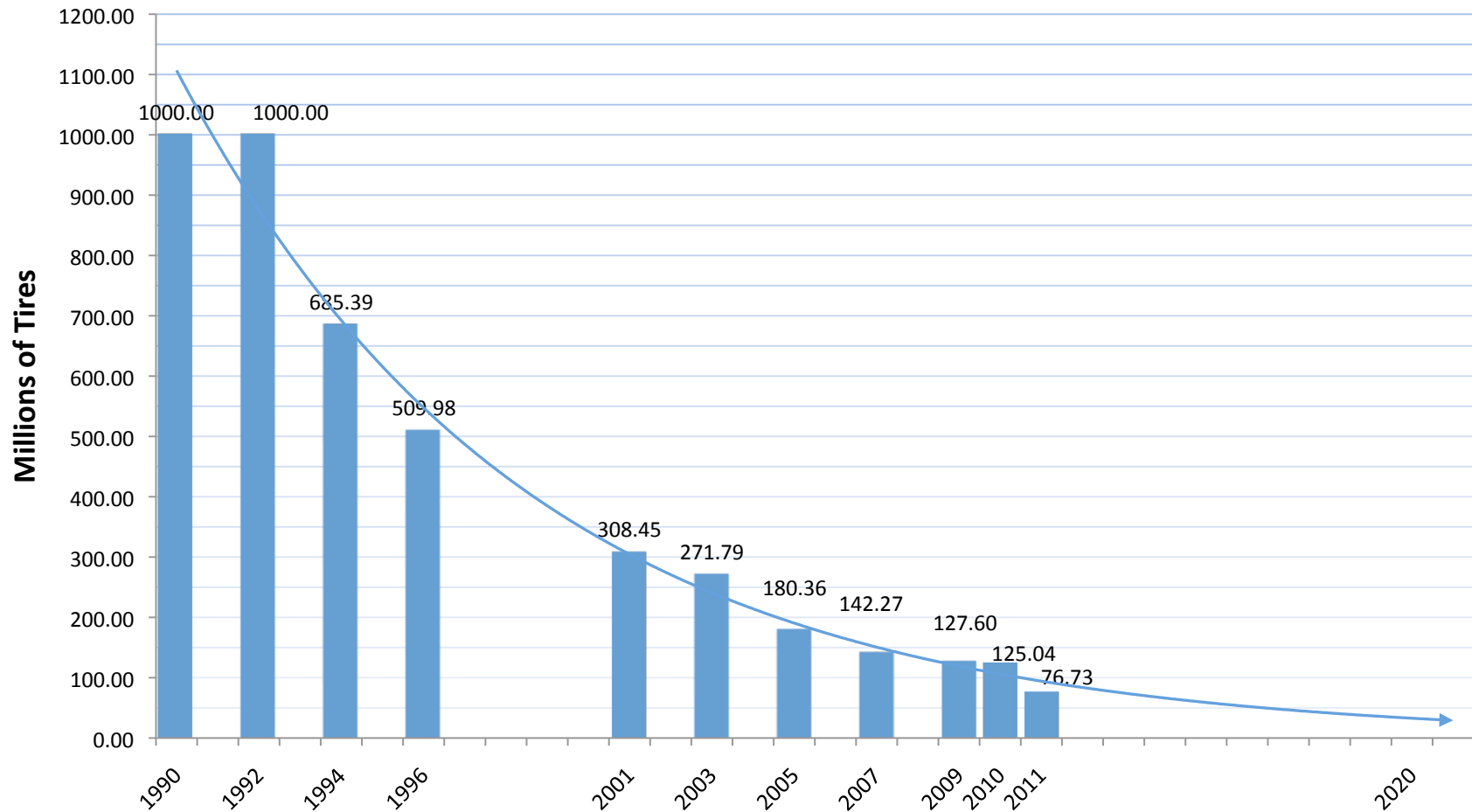
Preliminary 2013 Market Data

- Scrap tire generation above 304 million tires
- TDF markets have increased by 30%
 - Pulp mills major driver
- Ground rubber markets have increased to 1.3 billion pounds
- TDA markets have been stagnate
- All other markets of minor importance
- Overall recovery percentage close to 89%

Other Technologies

- Pyrolysis
 - 2 companies actively being developed
 - No commercial operation
 - Interest continues: still no results
 - At best: a minor market factor
- Devulcanization
 - Continues to be of interest
 - No known activity
 - Unlikely to be a market factor

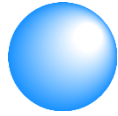
U.S. Stockpiled Scrap Tires 1990 - 2011





Market Development

- Many end use markets are influenced by state agencies
 - DOTs & rubber modified asphalt
 - DOH & TDA
- State agencies can support new markets by providing information on human & environmental issues
 - Infill, loose fill playground, mulch



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QUESTIONS?

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