



Resource Conservation Challenge (RCC)

Scrap Tire Workgroup

by
Mark Schuknecht
Environmental Protection Agency
Scrap Tire Workgroup Coordinator
02/23/2010

Acknowledgment
Workgroup Committee Chairmans contributions of slides and photographs

RCC Scrap Tire Workgroup

✦ Three RCC Goals

- Prevent pollution and promote reuse and recycling;
- Reduce priority and toxic chemicals in products and waste; and
- Conserve energy and materials.

The Scrap Tire Workgroup

✦ Began in 2003 as part of one of 4 RCC Pillars

✦ Collaboration of

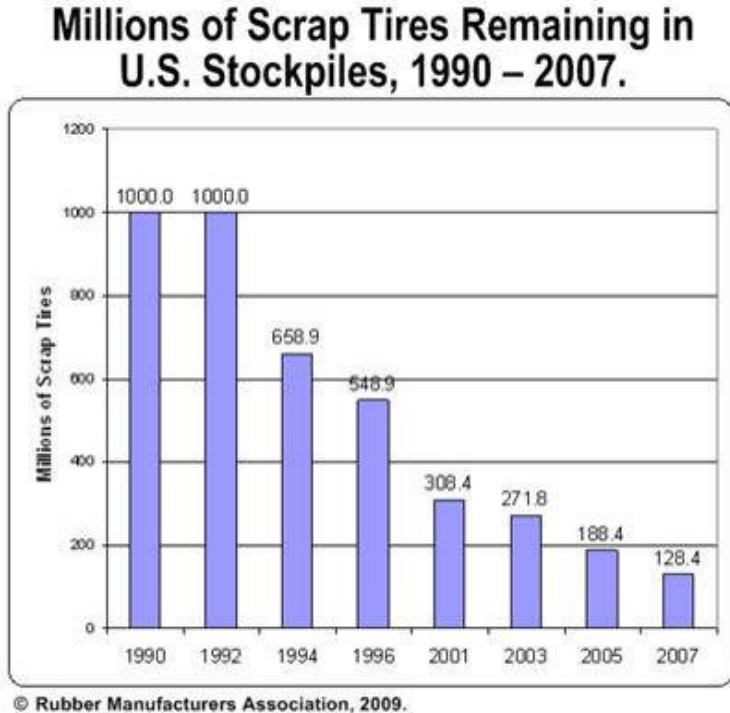
- 85 Members made up from
- Federal, State, Industry, Academia

✦ Works Mainly Via:

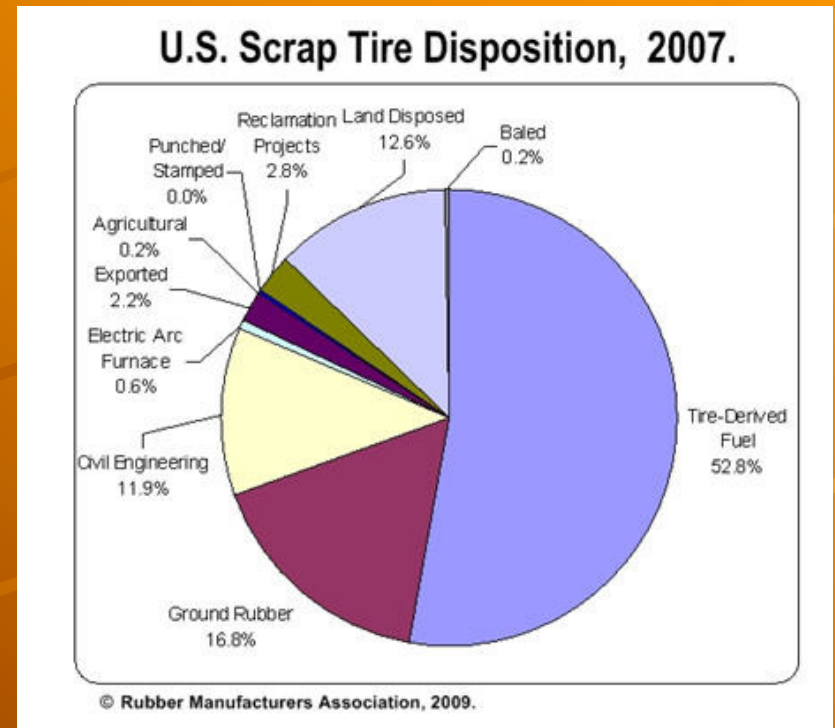
- Conference Calls
- E-Mails
- Annual meetings

Reuse Markets and Data

Scrap Tire Reduction Trends



Reused for



RCC Scrap Tire Workgroup Accomplishments

- ✦ 85% were diverted to Beneficial Uses by 2008
- ✦ 55% of the Remaining Tire Piles were remediated by 2008

Remediation Examples

Before



During



After



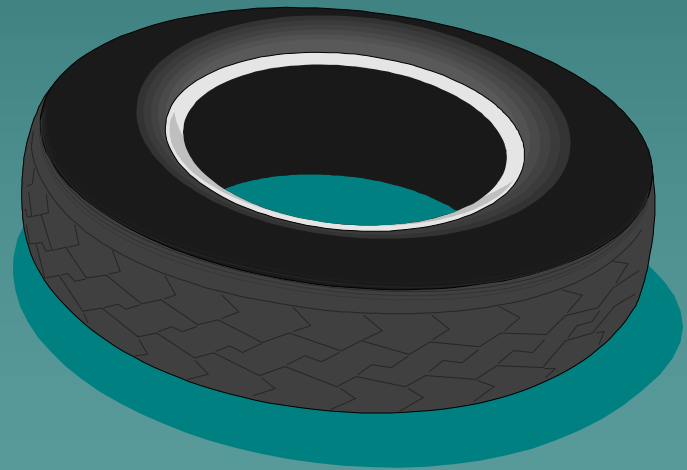
Scrap Tire Workgroup Committees

- Goals
- Civil Engineering
- Ground Rubber
- Rubberized Asphalt
- Tire Derived Fuel



EPA RCC Scrap Tire Workgroup

GOALS COMMITTEE



Elizabeth Hoover, Arkansas DEQ, Chairman

Goals Committee

11 Members

Allan Lassiter, Virginia DEQ

Michael Blumenthal, RMA

Dan Fester, Missouri DNR

Terry Gray, TAG Resources Recovery

Cynthia Hackathorn, Texas CEQ

Denise Kennedy, DK Enterprises

Todd Marvel, Illinois EPA

Pam Moore, North Carolina, Div of SW

Mary Sikora, TIA, Recycling Research Institute

Kara Steward, Washington Dept. of Ecology

Mark Schuknecht, US EPA

EPA RCC Scrap Tire Workgroup Goals

■ Traditional Numerical Goals

- Increase by 5% scrap tires diverted to beneficial uses by 2012 versus 2009

Before



After



Traditional Numerical Goals

- Reduce tire piles 65% by 2012

Before



After



EPA RCC Scrap Tire Workgroup Goals

■ Market Support Goals

- Strive to support all market sectors and sub-sectors
- Post information on pertinent websites and develop Fact Sheets
- Foster higher uses by discouraging tire monofilling, landfilling and land reclamation
- Encourage careful review of proposed technologies
- Seek to identify champions and encourage participation of all states on the Workgroup
- Encourage use of ASTM Standards for tire rubber applications
- Use “average tire weight” in place of PTE for measurement of tire generation data

Rollin' Rollin'
Rollin' Rollin'



RCC Scrap Tire Workgroup Goals Committee

Elizabeth Hoover, Chair
Arkansas Dept. of Environmental Quality
Solid Waste Management Division

ehoover@adeq.state.ar.us

Phone: (501) 682-0583

www.adeq.state.ar.us

A collection of military medals and a compass on a wooden surface. The medals include a red ribbon with a circular emblem, a blue ribbon with a circular emblem, and two silver Maltese crosses with central emblems. A pair of gold-rimmed glasses and a silver compass are also visible.

RCC Scrap Tire Workgroup Civil Engineering Committee

Todd Marvel, Illinois EPA (Chairman)



RCC Scrap Tire Workgroup Civil Engineering Committee

12 Members

Serj Amirkhanian, Clemson University

Michael Blumenthal, RMA

Terry Gray, TAG Resource Recovery

Jason Harrington, FHWA

Dr. Dana Humphrey, Univ. of Maine

Denise Kennedy, DK Enterprises

Blake Nekson, MN DOT

Monte Niemi, First State Tire Recycling

Bill Vincent, Tire Gator

Lou Zicari, Univ. of Buffalo

Jim Gilbert, NT ESD

Steve Smith, EPA Region 4

Beneficial Use of Tire Shreds in Civil Engineering Applications

- ◆ Defined as the use of scrap tires, usually shredded, in lieu of conventional construction materials
- ◆ Substitute for gravel, sand, light-weight fill materials
- ◆ Today referred to as tire-derived aggregate (TDA)





Why Use Tire Shreds?

- ◆ Tire shreds have properties that civil engineers need
 - Lightweight (1/3 weight of soil)
 - Good thermal insulation (8 X better than soil)
 - Good drainage (10 X better than soil)
 - Compressible



Why Use Tire Shreds?

- ◆ Light weight and low earth pressure are very beneficial where there is poor soil structure
 - Weak foundation soils
 - Increase slope stability
 - Reduce settlement
 - Landslide stabilization
- ◆ Tire shreds can improve engineering performance
- ◆ Tire shreds are often the least cost alternative

Primary Categories of CE Applications

Light weight fills



Sound barrier



Vibration damping



Highway backfill



Primary Categories of CE Applications

Road Construction



Septic drain-fields



Residential foundation backfill



Landfill construction/remediation





Major CE Committee Accomplishments

- ◆ Water quality and environmental toxicology study (completed Nov 2006)
- ◆ TDA CE Applications Compendium (completed Summer 2007)

<http://www.epa.gov/epawaste/conserva/materials/tires/tdastudy.pdf>



Major Committee Projects

- ◆ Develop a DVD that illustrates the legitimacy of TDA use in CE applications (in progress – scheduled completion: Spring 2010)
 - Educate stakeholders and
 - Encourage CE applications of TDA
 - Identify limitations
 - Address environmental concerns
 - Provide resources and Data
- ◆ Web-based inventory of information related to TDA use in CE applications (scheduled completion: Spring 2010)



Contact

Todd Marvel
CE Committee Chairman

Illinois EPA

Todd.Marvel@illinois.gov

(217) 524-5024

EPA RCC Scrap Tire Workgroup

Ground Rubber Committee

Jim Gilbert, NY ESD. Chairman

RCC Ground Rubber Committee

10 Members

Michael Blumenthal, Rubber Manufacturers Asso.

Toni Duggan, New Mexico Environment Dept .

Lisa Evans, Kentucky DEP

Terry Gray, TAG Resource Recovery

Elizabeth Hoover, Arkansas DEQ

Denise Kennedy, DK Enterprises

Mary Sikora, TIA, Recycling Research Institute

David Forrester, Liberty Tire Recycling

John Amato, JJA Sports

Sally French, Cal Recycle

Committee Direction

- Purpose: Promote the use of ground rubber made from scrap tires
- Focusing on three activities to enhance market growth:
 - Educate producers and potential users
 - Identify barriers and solutions
 - Support activities that would overcome barriers and implement solutions

Ground Rubber Definition

- Ground rubber (also known as “crumb rubber”)
- Defined by ASTM
- Various sizes of ground rubber
 - Coarse Rubber: 1 inch to 4 mesh
 - Ground Rubber: 10 to 80 mesh
 - Fine Grind Rubber: 80 to 400 mesh



Ground Rubber Processing

- It takes a lot more effort, machinery and skill to make good quality ground rubber than it does to make TDF or TDA
- There are two major processing technologies:
 - Ambient grinding by mechanical teeth
 - Cryogenic grinding by freezing & crushing



Common Ground Rubber Uses

- Synthetic (artificial) turf
- Playgrounds
- Mulch
- Molded products
- Rubberized asphalt
- Other:
 - Equestrian
 - Cow mattresses

Synthetic Turf

- Ground rubber is used as infill between blades of artificial grass in a carpet-like application



Playgrounds

- Ground rubber is applied to a uniform depth to protect children from falls
- Three common uses around playground equipment
- include: Mulch or Loose fill, Pour-in-place, Tiles



Mulch

- Rubber mulch is used as longer-lasting alternative to bark and other natural mulches to keep out weeds and/or help retain soil moisture
- It is often used around plants, backyard pools, foundations and other objects



Molded Products

- Plastic, virgin rubber, urethane or other binders are combined with ground rubber to mold parts
 - Large compression molded objects such as tiles and signpost holders
 - Injection molding can yield a wider variety of more technical parts such as automobile parts
 - Ground rubber can be made into sheet goods to make things like floor mats



Contact Info

RCC STWG Rubber Committee:

James Gilbert, Chairman

Empire State Development

400 Andrews St.

Rochester, NY 14604

(585) 325-1944

jgilbert@empire.state.ny.us

RCC Rubberized Asphalt Committee

Chairman:

Serji Amirkhanian,
Clemson University

7 Members

Michael Blumenthal, RMA

Doug Carlson, RPA

Jorge Castillo, TCEQ

Jason Harrington, FHWA

Todd Marvel, Illinois EPA

Lon Revall, Georgia DNR

Jim Gilbert, NY



Michelin Boulevard
Anderson County, SC

Purpose

- Expand use of scrap tires in roads
- Determine and develop ways to:
 - Educate public, increase awareness of benefits
 - Identify solutions for perceived barriers
 - Cultivate champions in private and public sectors



Goals and Targets

- Increase the amount of crumb rubber used in asphalt by 5%
- Success of goal will be measured by total use of RA

SC Hwy 261



Project Descriptions

- Conduct research:
 - Email survey to identify:
 - States using RA regularly
 - Identify any perceived obstacles
 - Locate decision makers
 - Promote RA:
 - Create a video tool box

Richland County, SC



Rubberized Asphalt Committee

For more information, contact:
RCC STWG Rubberized Asphalt
Committee Chairman

Serji Amirhanian
Clemson University SC
864 656 6799
Kcdoc@clemson.edu



Tire Derived Fuel Committee

George Gilbert, KY DEP. Chairman



Cement Kiln in Juarez, Mexico.



Tire Derived Fuel Committee

13 Members

Michael Blumenthal, RMA Asso.
Mike Benoit Cement Kilm Coalition
Fernando Buton, CIWMB
Terry Gray, TAG Resource Recovery
Mary Hunt, EPA Region 3
Todd Marvel, Illinois EPA
Tyrone Willson, Portland Cement Assoc.
Brian Shrager, EPA OPQPS
Rick Colyar, Columbus-McKinnon
Keri Meyers, LA DEQ
Monte Niemi, First State Tire Recycling
Mike Winek, Pittsburg Attorney
Kara Steward, Washington Dept. of Ecology



Littleton, MA

Tire Derived Fuel Committee

Purpose of the committee:

To support the expanded and appropriate use of scrap tires as supplemental energy resource in properly permitted industrial facilities



Tire recycling rates have increased dramatically over recent years, caused in large part by the creation of tire-derived-fuel.
—Photo courtesy of Rubber Manufacturers Association

Tire Derived Fuel Committee

Disposal of scrap tires in tire piles is not an acceptable management practice because of the risks posed by tire fires, and because tire piles can provide habitats for disease vectors such as mosquitoes.

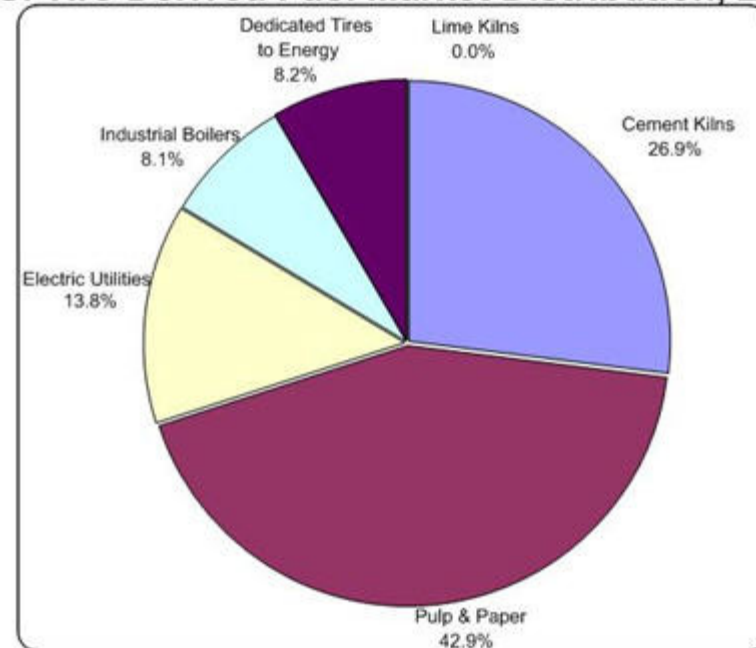
Stanislaus Co. Ca Tire Fire



Tire Derived Fuel Committee

In 2007, more than 303 million scrap tires were generated in the U.S. Nearly 107 million of these tires were recycled into new products and 164 million were reused as tire-derived fuel (TDF) in various industrial facilities.

U.S. Tire-Derived Fuel Market Distribution, 2007.



© Rubber Manufacturers Association, 2009.

Tire Derived Fuel Committee

TDF is one of several viable alternatives to divert newly generated scrap tires from disposal in tire piles, and to reduce existing tire piles.



Tire Derived Fuel Committee

- *EPA issued and posted the TDF fact sheet at* <http://www.epa.gov/osw/conservation/materials/tires/tdf-fs.pdf>
- **EPA Fact Sheet:**

“EPA supports the highest and best practical use of scrap tires in accordance with the waste management hierarchy, in order of preference: reduce, reuse, recycle, waste-to-energy, and disposal in an appropriate facility.”

Tire Derived Fuel Committee

EPA Fact Sheet Cont:

“Based on over 15 years of experience with more than 80 individual facilities, EPA recognizes that the use of tire-derived fuels is a viable alternative to the use of fossil fuels. EPA testing shows that TDF has a higher BTU value than coal.”

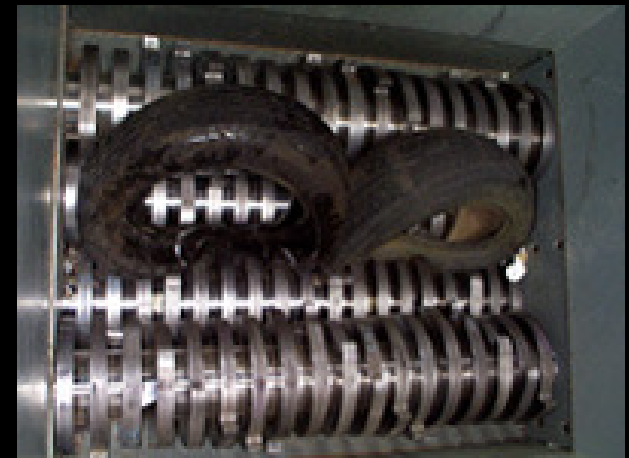


Tire Derived Fuel Committee

EPA Fact Sheet Cont:

“The Agency supports the responsible use of tires in portland cement kilns and other industrial facilities, so long as the candidate facilities:

- Have a tire storage and handling plan;
- Have secured a permit for all applicable state and federal environmental programs; and
- Are in compliance with all the requirements of that permit.”



Tire Derived Fuel Committee

Accomplishments:

- Compiled data to help prospective users of TDF and
- Compiled a list of barriers to TDF use, by state.



Tire Derived Fuel Committee



For more information, contact:

George Gilbert

KY Department for Environmental Protection

Chairman of TDF Committee

502-564-2225, ext. 217

george.gilbert@ky.gov

Open Invitation to Join Scrap Tire Work Group

- ✦ Call for new members
- ✦ Especially need Region 8 States Participation
- ✦ Annual information request
- ✦ Share information
- ✦ Interagency support

SCRAP TIRE MARKETS IN THE UNITED STATES

9th BIENNIAL REPORT

May 2009



1400 K Street, NW
Washington, DC 20005
tel (202) 682-4800
fax (202) 682-4854

http://www.rma.org/scrap_tires/

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Contact information:

- ✦ Workgroup Coordinator:
Mark Schuknecht
US EPA ORCR RCSD
703-308-7294
Schuknecht.mark@epa.gov
- ✦ Workgroup Chairman
Elizabeth Hoover
Arkansas Dept. of Enviro. Quality
501-682-0583
EHoover@adeq.state.ar.us
- ✦ RCC Scrap Tire Workgroup Website
[http://www.epa.gov/epawaste/conserv
e/materials/tires/workgroup.htm](http://www.epa.gov/epawaste/conserv
e/materials/tires/workgroup.htm)



Questions

Before



After

