



EPA's Industrial Materials Recycling Program

*An Overview and Tools to
support recycling and reuse*

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Recovery**

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Overview

- What are Industrial Materials?
- Why use industrial materials in roadways?
- What is the U.S. EPA's Industrial Materials Recycling (IMR) Program?
- What are some challenges to increased use of industrial materials?
- What are some key resources to support reuse?

What are Industrial Materials?

- Byproducts of industrial processes
 - Coal combustion, metal casting, pulp and paper production, construction & demolition, etc.
 - Over 500 million tons generated annually
- Materials Include:
 - CCPs; C&D materials, spent foundry sand
 - Used tires, slag, silica fume



Why use Industrial Materials?

■ Environmental Benefits

- ❑ Avoided impacts from processing of virgin materials (e.g. GHG emissions)



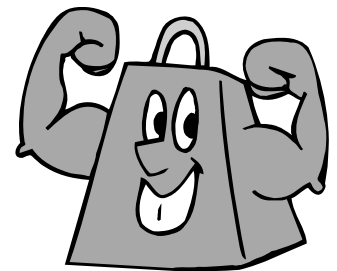
■ Economic Benefits

- ❑ Reduced costs associated with disposal
- ❑ Cost savings from use instead of more costly materials



■ Performance Benefits

- ❑ Perform as well as or better than traditional materials
 - Increased strength, improved workability, resistance to chemical attack; longer life



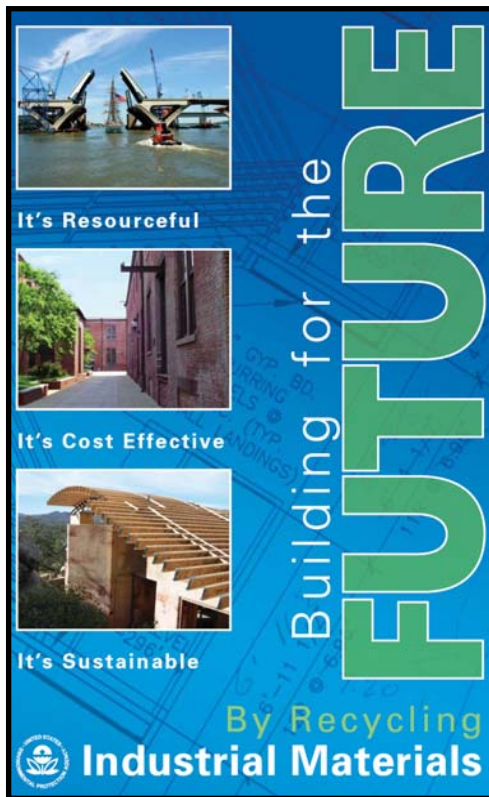
What is the U.S. EPA's IMR Program?



- Part of the EPA's **Resource Conservation Challenge (RCC)**, a national effort to conserve materials, save energy and reduce greenhouse gas emissions by **managing materials more efficiently**

IMR is one of four priority areas of the RCC

What is the U.S. EPA's IMR Program?

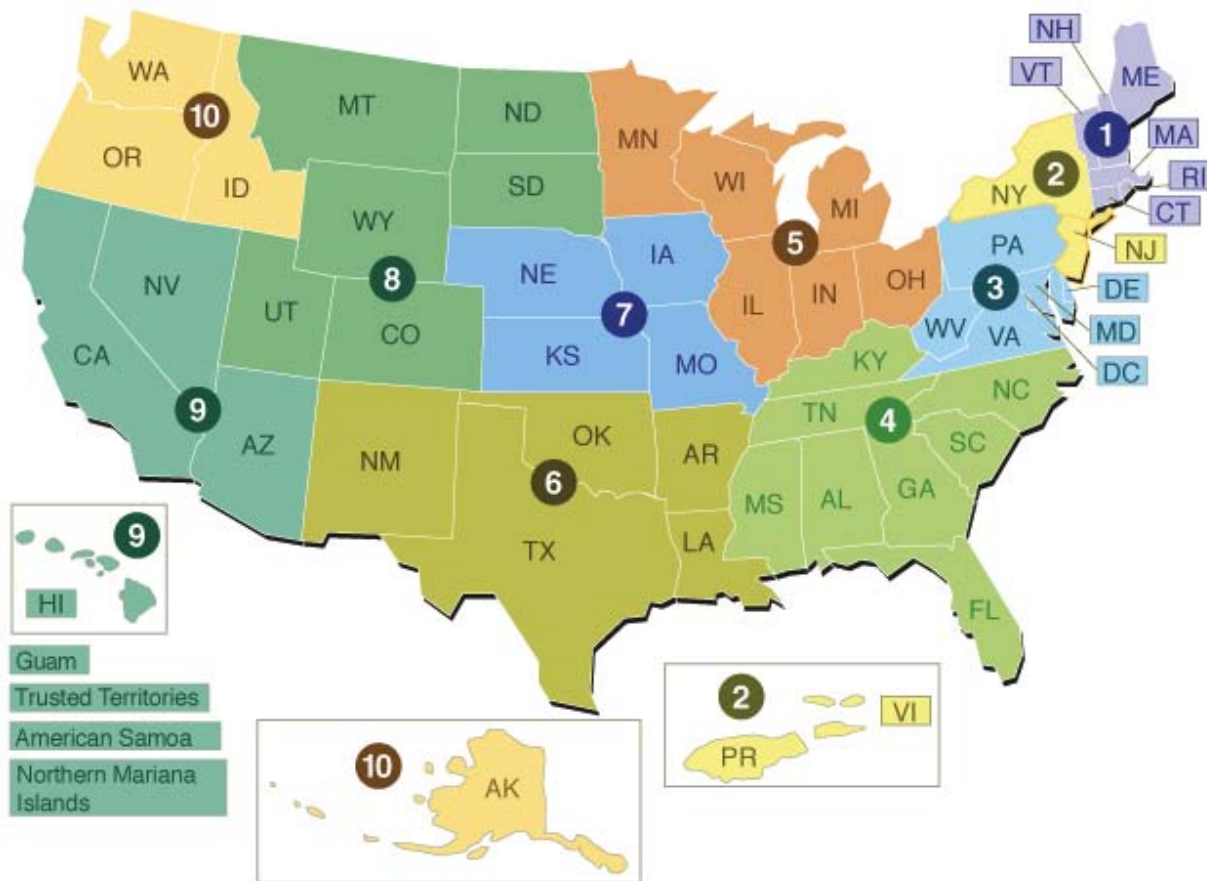


- Focusing on increasing the recycling of select materials:
 - CCPs; C&D (asphalt, concrete), spent foundry sand; used tires, slag, silica fume, pulp and paper byproducts
- Applications:
 - Roadways, Transportation, Buildings, Agricultural

www.epa.gov/industrialmaterials

What is the U.S. EPA's IMR Program?

- IMR program staff in each of 10 Regions



What is the U.S. EPA's IMR Program?

IMR Focus areas

1. Measurement and benefits
2. Regulatory and safety issues
3. Supporting developing markets
4. Communications and benefits

What is the U.S. EPA's IMR Program?

Key IMR Program Activities

- The Construction Initiative
 - Focuses on building/transportation projects
 - Offers opportunities for public recognition through case studies and media events
 - EPA staff and partners provide technical assistance
- The Coal Combustion Products Partnership
 - Collaborative program to promote safe and effective use of CCPs
 - www.epa.gov/C2P2

What is the U.S. EPA's IMR Program?

Key IMR Program Activities

- Mid-Atlantic Green Highways Partnership
 - Voluntary partnership among FHWA, EPA, state DEQs/DOTs, industry and others
 - www.greenhighways.org
- NEW! “Green Transportation and Construction Initiative” in New York, New Jersey

***Charles Harewood, U.S. EPA Region 2, will present
Wednesday AM at TRB***

A few of EPA's Industrial Materials Recycling Partners

- Federal Highway Administration (FHWA)
 - Office of Pavement Technology
- U.S. Department of Agriculture (USDA)
 - Agricultural Research Service
- National Association of County Engineers (NACE)
- American Public Works Association (APWA)
- Associated General Contractors of America (AGC)

What are some challenges to use of industrial materials?

- Approved materials and uses vary by state
 - State solid waste regulatory agencies approve use and application for materials
- Lack of approved transportation specifications for use of materials
 - Some DOTs unfamiliar with materials; materials not specified (or even prohibited) in specs or contracts
- Environmental risk concerns
 - Perceived vs actual risks

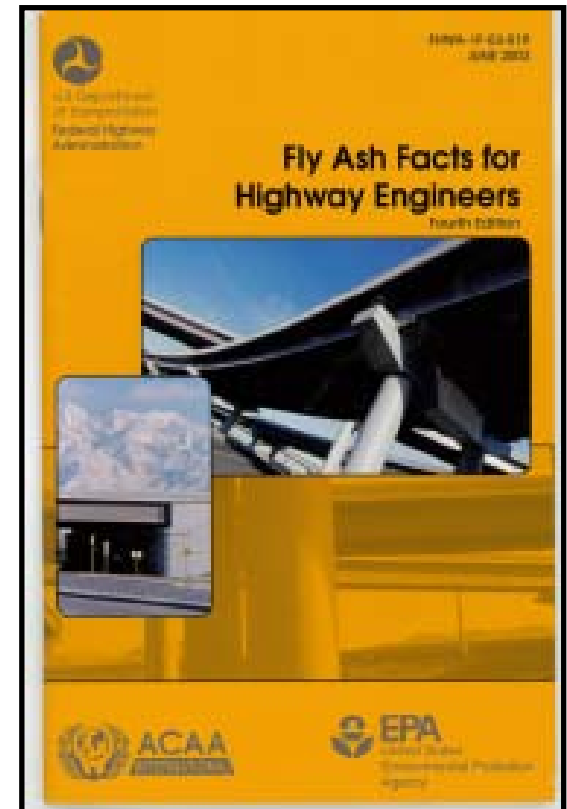
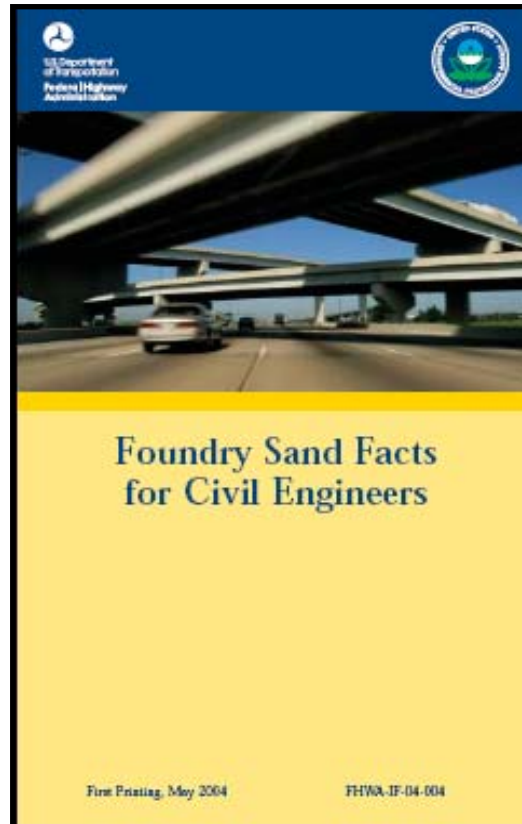
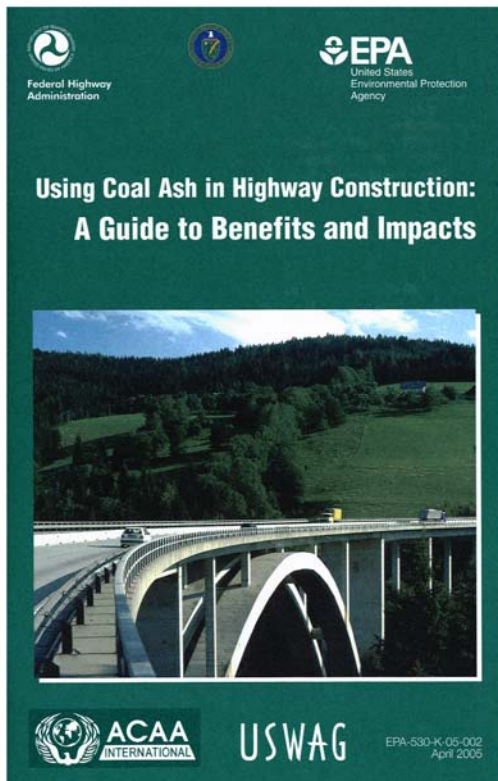


What are some key resources to address those challenges?

- EPA/FHWA publications
- Industry associations
- Academic research centers
- Existing specifications for industrial materials
- State Program Highlights
- EPA and FHWA staff



Resources: Publications





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Using Recycled Industrial Materials in Roadways



Greening the Nation's Infrastructure.

This fact sheet discusses the use of industrial materials in roadways and other infrastructure projects as an alternative to virgin materials and construction products. Industrial materials are the byproducts of industrial processes. Each year in the United States, industries produce over half a billion tons of potentially usable materials, such as coal combustion products (CCPs), construction and demolition (C&D) materials, spent foundry sands, used tires, and slags. Many have chemical and physical properties that make them valuable resources when recycled or beneficially reused, but they are often disposed of as waste. The U.S. Environmental Protection Agency (EPA) is committed to increasing the recycling of industrial materials as part of its *Resource Conservation Challenge*, a national effort to save energy and reduce greenhouse gas emissions by managing materials more efficiently. Industrial materials recycling is greening the nation's infrastructure by making roadways more durable, conserving natural resources, decreasing energy use, and reducing greenhouse gas emissions.

www.epa.gov/industrialmaterials

Publication highlights benefits, provides resources and references, such as ASTM specifications

Resources: Industry Associations

- The Industrial Resources Council (IRC)
 - American Coal Ash Association
 - Construction Materials Recycling Association
 - Foundry Industry Recycling Starts Today
 - National Council for Air and Stream Improvement
 - National Slag Association
 - Rubber Manufacturers Association



Please visit: www.industrialresourcescouncil.org

Resources: The Recycled Materials Resource Center

■ RMRC Goals:

- Test, evaluate, develop appropriate guidelines (See: www.rmrc.unh.edu/tools/uguidelines/index.asp)
- Make information available to State transportation departments and other interested parties
- Analyze potential long-term considerations that affect the physical and environmental performance
- Work cooperatively with Federal and State officials to reduce the institutional barriers that limit widespread use

Please visit: www.rmrc.unh.edu/

Resources: Existing Specifications

- Specs developed by the RMRC:
 - Glass Cullet use for Soil Aggregate Base Course
 - Reclaimed Concrete in Portland Cement
 - Reclaimed Concrete in Granular Base
 - Reclaimed Asphalt Shingles in Asphalt Concrete
- AASHTO Specs:
 - M295 – fly ash
 - M302 - Ground granulated blast furnace slag

Resources: State Program Highlights

■ Pennsylvania DOT

- ❑ Pollution Prevention Section, Strategic Recycling program
- ❑ www.dot.state.pa.us/Internet/Bureaus/pdDesign.nsf/infoSpecifications?OpenForm

■ Texas DOT

- ❑ Specifications Using Recycled Materials by Application
- ❑ www.dot.state.tx.us/business/contractors_consultants/recycling/speclist.htm

Resources: People

- EPA's IMR Program Staff
 - ❑ Staff in each EPA Region can assist you
 - ❑ Send me an email and I'll put you in touch with an EPA person in your area (villamizar.nicole@epa.gov)
- Federal Highway Administration FALCON Team
 - ❑ Focused on increasing use of recycled materials
 - ❑ Contact: Jason Harrington (jason.harrington@dot.gov)
- We want to highlight your great work!



Summary

- U.S. EPA is committed to increasing the recycling and beneficial use of industrial materials in an environmentally sound manner
- Using recycled industrial materials in roadways makes good sense:
 - Environmental benefits – supports GHG emission reductions – and key to reaching today's state and local climate change policies
 - Economic benefits – lower cost materials
 - Performance – makes structures stronger, more durable

Summary

- While some challenges exist, there are organizations, people, and tools and resources to address those challenges
 - EPA/FHWA programs and publications
 - Industry and academic associations (RMRC)
 - Existing specifications and model programs
 - EPA and FHWA staff members!
- EPA would like to highlight the great work you're already doing through:
 - Case studies, highlights on our website, press releases, etc.



Thank you!

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Review of Key Websites

- U.S. EPA's IMR Program:
www.epa.gov/industrialmaterials
- Recycled Materials Resource Center:
www.rmrc.unh.edu/
- Industrial Resources Council:
www.industrialresourcescouncil.org
- FHWA Office of Pavement Technology:
www.fhwa.dot.gov/PAVEMENT/recycling/index.cfm