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# Sustainable Materials Management: Materials Management and the 3Rs Initiative

## Introduction

The fact sheet summarizes information on the 3Rs Initiative and related policies to foster materials management through the development, use, and disposition of products and services. These policies, through the efficient use of resources and materials, integrate both environmental and economic approaches to achieve sustainable development goals in a sound “material-cycle” society. The fact sheet briefly describes this initiative and Japan’s efforts to further sustainable development goals using the 3Rs. It also briefly describes some related international and U.S. resources related to 3Rs materials management concepts. The fact sheet is not comprehensive; rather, it provides a starting point for readers interested in investigating the topic.

## Summary of the 3RS Initiative

The three central goals of the 3Rs Initiative are to **Reduce**, **Reuse** and **Recycle**. The 3Rs Initiative [<http://usinfo.state.gov/xarchives/display.html?p=washfile-english&y=2004&m=June&x=20040610193747liameruoy0.9049145&t=xarchives/xarchitem.html>] is intended to:

- reduce and reuse waste and recycle resources and products to the extent economically feasible
- reduce barriers to the international flow of goods and materials for recycling and remanufacturing, recycled and remanufactured products, and cleaner, more efficient technologies, consistent with existing environmental and trade obligations and frameworks
- encourage cooperation among various stakeholders (central governments, local governments, the private sector, non-government organizations, and communities), including voluntary and market-based activities
- promote science and technology suitable for 3Rs
- cooperate with developing countries in such areas as capacity building, raising public awareness, human resource development and implementation of recycling projects.

The 3Rs Initiative was introduced by Japan at the 2004 G8 Summit held at Sea Island, Georgia, and endorsed by world leaders at the Summit. Japan formally launched the 3R Initiative in Tokyo at the Ministerial Conference on the 3Rs Initiative [<http://www.env.go.jp/recycle/3r/en/info.html>] held in April 2005. A Senior Officials Meeting [[http://www.env.go.jp/recycle/3r/en/s\\_officials.html](http://www.env.go.jp/recycle/3r/en/s_officials.html)] on the 3Rs followed in March 2006 so that representatives from around the world could share knowledge of 3Rs activities, communicate future plans, and consider transboundary movement of 3Rs-

related goods, materials, and products. In October 2006, Japan hosted an Asia 3R Conference [<http://www.env.go.jp/recycle/3r/en/asia.html>] to explore these matters further.

### **The 3Rs in Japan**

In June 2007, Japan announced its "Becoming a Leading Environmental Nation Strategy in the 21st Century - Japan's Strategy for a Sustainable Society [<http://www.env.go.jp/en/focus/070606.html>]." The document includes proposed domestic and international actions to promote the 3Rs in order to achieve sustainable material cycles. The actions fall into four categories:

- actions for creating a sound material-cycle society in Asia
- upgrade Japan's 3Rs technologies and systems
- contribute to mitigating climate change through the 3Rs
- promote the 3Rs Initiative, advocated by Japan, in the G8 process

Japan's approach to the 3Rs [<http://www.env.go.jp/recycle/3r/en/approach.html>] supports its stated vision to achieve a zero-waste society at home and to cooperate in furthering zero-waste goals abroad. It is built on extensive legislation to support recycling goals. For example, Japan has incorporated extended producer responsibility principles into its legislation to manage wastes and has developed green purchasing programs to support recycling goals. The 3Rs in Japan includes an emphasis on appropriate transboundary movement of materials and waste within the region.

The Ministry of Environment [<http://www.env.go.jp/recycle/3r/en/index.html>] in Japan, working with organizations such as the Institute for Global Environmental Strategies [[http://www.iges.or.jp/en/news/topic/0609\\_3r.html](http://www.iges.or.jp/en/news/topic/0609_3r.html)], conducts policy research, examines regional strategies, undertakes seminars, and takes other actions to promote the 3Rs. In that the 3Rs Initiative influences both environmental and economic policies in Japan to achieve sustainable development goals, the Ministry of Trade, Economy, and Industry [[http://www.meti.go.jp/english/policy/index\\_environment.html](http://www.meti.go.jp/english/policy/index_environment.html)] and the Institute of Developing Economies-Japan External Trade Organization (IDE-JETRO) [<http://www.ide.go.jp/English/Publish/Spot/29.html>] are partners in promoting the 3Rs.

### **Other Initiatives**

- **OECD.** The Organization for Economic Cooperation and Development (OECD) in 2004 initiated work on sustainable materials management (SMM) [[http://www.oecd.org/document/62/0,3343,en\\_2649\\_34395\\_37895358\\_1\\_1\\_1\\_1\\_00.html](http://www.oecd.org/document/62/0,3343,en_2649_34395_37895358_1_1_1_1_00.html)]. SMM takes an integrated, life-cycle approach promote sustainable material use – taking into account economical efficiency and social equity concerns. In addition to preventing wastes through waste minimization, SMM emphasizes the reuse of wastes as inputs for new products. OECD work on SMM is undertaken in close coordination with other OECD activities involving material flows and resource productivity

[[http://www.oecd.org/document/51/0,3343,en\\_2649\\_34395\\_34808435\\_1\\_1\\_1\\_1\\_00.html](http://www.oecd.org/document/51/0,3343,en_2649_34395_34808435_1_1_1_1_00.html)].

- **Germany.** Principles of “reduce, reuse, recover” [[http://www.bmu.de/english/waste\\_management/general\\_information/doc/4304.php](http://www.bmu.de/english/waste_management/general_information/doc/4304.php)] underlie policies established in Germany to foster sustainable materials management. The Closed Substance Cycle and Waste Management Act [<http://www.bmu.de/english/documents/doc/3230.php>], first published in 1994, was designed to integrate product responsibility into economic decision-making in order to build a life-cycle economy and avoid the generation of waste. The Act established a hierarchy of avoidance, recovery, and disposal that emphasizes waste avoidance in production, promotes low-waste products, and provides incentives for waste recovery practices.
- **China.** In 2005, China began drafted a law to establish a “circular economy” (CE) [[http://www.chinacp.com/eng/cppolicystrategy/circular\\_economy.html](http://www.chinacp.com/eng/cppolicystrategy/circular_economy.html)] and provide a legal framework for the country’s national sustainable development strategy. The draft builds on The Cleaner Production Promotion Law of 2002, which established cleaner production as a national policy, and laid out a strategy both to reduce pollution at its source and improve resource utilization efficiency. A CE model also would serve to integrate planning for production goals and planning to reduce pollution more closely. CE is closely linked to industrial ecology: at the heart of the circular economy concept, one facility’s waste, in order to achieve highly efficient use and recycling of its resources (including energy, water, and materials), is another facility’s inputs. CE ideas in China have been influenced by policies in Japan and Germany, and CE represents an approach to adopting 3Rs “reduce, reuse, and recycle” strategies for materials management.

### **Some U.S. Activities and Additional Resources**

Particularly in the context of clean energy development and climate change, in a joint statement on April 7, 2007, the U.S. and Japan reaffirmed the goals of the 3Rs Initiative [<http://sanjose.usembassy.gov/economic.html>]. The press release reflects a U.S. emphasis on both multi-lateral and public-private U.S. domestic partnerships to achieve material management goals. A number of useful EPA Headquarters, EPA Regional, and U.S. federal government web-based resources reflect U.S. government interest in elements of the 3Rs. For example:

- EPA *Beyond RCRA: Prospects for Waste and Materials Management in the Year 2020* [<http://www.epa.gov/osw/vision.htm>]. EPA’s 2020 Vision Statement articulates “cradle-to-cradle” materials management strategies as an important goal for EPA
- EPA Resource Conservation Challenge (RCC) [<http://www.epa.gov/epaoswer/osw/consERVE/index.htm>] EPA’s RCC, like the 3Rs Initiative, is a national effort to help manage materials more efficiently from

- “cradle to cradle” using reduction, reuse, and recycling strategies. Goals of the RCC include pollution prevention, product stewardship, and the promotion of reuse and recycling, as well as the conservation of energy and materials
- EPA reduce, reuse, recycle [<http://www.epa.gov/msw/reduce.htm>]. EPA incorporates all three principles – reduce, reuse, and recycle – into its materials management strategy for municipal solid waste and has established recycling goals for various waste streams. Examples of EPA Regional web pages also addressing the 3RS include those of Region III [<http://www.epa.gov/region02/r3/>] and Region IX [<http://www.epa.gov/region09/waste/solid/reduce.html>]
  - EPA product stewardship [<http://www.epa.gov/epaoswer/non-hw/reduce/epr/index.htm>]. Broadly defined, product stewardship calls on all parties involved in the product life cycle—manufacturers, retailers, users, and disposers—to share responsibility for reducing the environmental impacts of products. Product stewardship may incorporate extended producer responsibility requirements. Region X has a product stewardship web page: [<http://yosemite.epa.gov/R10/OWCM.NSF/webpage/Product+Stewardship>]
  - U.S. government green purchasing. Environmentally Preferable Purchasing [<http://www.epa.gov/epp/>] is a federal program that encourages and assists agencies across the U.S. government in the purchase of environmentally preferable products and services. EPA’s comprehensive procurement guidelines [<http://www.epa.gov/epaoswer/non-hw/procure/index.htm>] promote the use of materials recovered from solid waste by requiring the Agency to purchase recycled-content products
  - U.S. government economics and trade [<http://sanjose.usembassy.gov/economic.html>]. Through multi-lateral and bi-lateral trade agreements such as the Central American Free Trade Agreement, the U.S. has taken steps to reduce waste and encourage reuse of materials
  - EPA partnership programs. EPA's Waste Minimization Program [<http://www.epa.gov/epaoswer/hazwaste/minimize/index.htm>] seeks to reduce or eliminate waste in manufacturing in the United States. Chemical management services [<http://www.epa.gov/minimize/cms.htm>], provide business model in which a customer reduces chemical use and cost by purchasing chemical services rather than just chemicals. WasteWise [<http://www.epa.gov/epaoswer/non-hw/reduce/wstewise/index.htm>] targets the reduction of municipal solid waste and select industrial wastes through tools such as waste assessments and tracking. The Federal Electronics Challenge [<http://www.federalelectronicschallenge.net/>] encourages federal facilities and agencies to: purchase greener electronic products, reduce impacts of electronic products during use, and manage obsolete electronics in an environmentally safe way. Plug-In to e-Cycling [<http://www.epa.gov/epaoswer/osw/consERVE/plugin/>] is a partnership between EPA and consumer electronics manufacturers and retailers to offer consumers more opportunities to donate or recycle - to "eCycle" - their used electronics. The Coal Combustion Product Partnership [<http://www.epa.gov/epaoswer/osw/consERVE/c2p2/>] is a cooperative effort between the EPA, other U.S. government agencies, and private associations to

help promote the beneficial use of coal combustion products. In Recycle on the Go [<http://www.epa.gov/epaoswer/osw/consERVE/onthego/index.htm>], EPA is partnering with government agencies and businesses to introduce recycling programs where large numbers of people gather, such as parks, stadiums, transportation hubs, and shopping centers. The EPA Design for the Environment (DfE) Program [<http://www.epa.gov/dfe/>] works with individual industry sectors to reduce human health and environmental risks and costs of existing and alternative products, processes, and practices – e.g., by using green chemistry principles. The Green Suppliers Network [<http://www.epa.gov/greensuppliers/>] is a collaborative venture among industry, the EPA and the Department of Commerce to engage their small and medium-sized suppliers in low-cost technical reviews that focus on process improvement and waste minimization

Similarly, “cradle-to-cradle” approaches to materials management are promoted on web pages developed by a number of U.S. States. Some examples include:

- Minnesota –product stewardship  
[<http://www.pca.state.mn.us/oea/stewardship/index.cfm>]
- Washington - product stewardship  
[<http://www.pca.state.mn.us/oea/stewardship/index.cfm>]
- New Jersey – product stewardship  
[[http://www.state.nj.us/dep/dshw/recycle/prd\\_stewards.htm](http://www.state.nj.us/dep/dshw/recycle/prd_stewards.htm)]
- New York – product stewardship/extended producer responsibility  
[[http://www.nyc.gov/html/nycwasteless/html/in\\_business/product\\_stewardship.shtml](http://www.nyc.gov/html/nycwasteless/html/in_business/product_stewardship.shtml)]
- Louisiana – reduce, reuse, recycle  
[<http://www.leeric.lsu.edu/energy/rrr/index.html>]
- Utah – green choices: the 3rs [<http://www.greenchoices.utah.gov/3rs.htm>]
- Montana – reducing reusing and recycling in State government  
[<http://www.deq.state.mt.us/Recycle/3Rs/3Rindex.asp>]
- Massachusetts – reduce, reuse, recycle  
[<http://www.mass.gov/dep/recycle/reducere.htm>]
- Vermont – reduce, reuse, recycle  
[<http://www.anr.state.vt.us/dec/wastediv/R3/WReduct.htm>]
- California – reduce reuse recycle web sites  
[<http://www.ciwmb.ca.gov/Schools/Links/Recycle.htm>]