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**Assessment, monitoring and early warning: state of the environment**

**Follow-up to the World Summit on Sustainable Development: contribution  
of the United Nations Environment Programme to the forthcoming session  
of the Commission on Sustainable Development**

**Reduce, reuse and recycle concept (the “3Rs”) and life-cycle  
economy**

**Note by the Executive Director**

The annex to the present note provides background information on the “3Rs” reduce, reuse and recycle waste minimization concept which has been prepared as an elaboration of chapter IV, on domestic, industrial and hazardous waste management, of document UNEP/GC.23/3/Add.5. The annex also contains a table listing potential projects on life-cycle economy. The annex is being circulated without formal editing.

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\* UNEP/GC.23/1.

## Annex

### The 3R Concept and Waste Prevention

1. The concept of “3R” refers to reduce, reuse and recycle, particularly in the context of changing consumption and production patterns. It calls for an increase in the ratio of recyclable materials, further reusing of raw materials and manufacturing wastes, and overall reduction in resources and energy used. These ideas are applied to the entire lifecycles of products and services – from design and extraction of raw materials to transport, manufacture, use, dismantling/reuse and disposal. A fourth “R” (repair) was introduced recently<sup>1</sup> to integrate promotion of repair services, which in principle helps to expand product life spans of durable products, and thereby further contributes to waste prevention.
2. Some achievements and examples of the 3R concept and waste prevention are as follows:
  - **Recycling (Japan):** The glass cullet (processed recovered glass) use rate has been increasing every year since FY1990 and had already reached 90.3% by FY2003, exceeding the 85%-level that was expected to be achieved by FY2005 under the Law for Promotion of Effective Utilization of Resources.
  - **Reuse (Canada):** Mandatory provisions of used oil deposit/collection facilities by all vendors of lubricants to target used oil produced by different users, have enabled the return of used oil to the point of purchase for reuse or recovery.
  - **Minimization and Recovery (Germany):** Ordinance on the Avoidance and Recovery of Packaging Waste, 1998, calls for avoidance or reducing the environmental impacts of waste arising from packaging. By June 2001, the share of all packaging waste being recovered was 65 percent by weight, and the share of recycling was 45 percent by weight.
  - **Recycling and Composting (USA):** In 1999, recycling and composting activities prevented about 64 million tons of material from ending up in landfills and incinerators. USA recycles 28 percent of its waste, a rate that has almost doubled during the past 15 years. 42 percent of paper, 40 percent of plastic soft drink bottles, 55 percent of aluminum beer and soft drink cans, 57 percent of steel packaging, and 52 percent of major appliances are now recycled.

### Japan's 3R Initiative towards a 'Sound Material Cycle Society'

3. Japan's impetus for developing a 'Sound Material Flow Society' is derived from three interrelated causes – [1] the sheer volume of wastes being generated, [2] rapid industrial development, and [3] the limitations placed by Japan's small land mass. This law, and its constituent individual laws and plans, lie at the core of Japan's 3R Initiative.
4. A 'Sound Material Cycle Society' is defined as a society in which the *consumption of natural resources is minimized* and the *environmental load is reduced* as much as possible. The basic principles of the Initiative call for “the realization of a society in which sustainable development is possible with less environmental impact; prioritization of handling products, wastes and recyclables; and ensuring appropriate material cycle in nature.”
5. The Initiative has enabled the refocus of existing environmental laws on material flows, and enact new ones to fill gaps in existing laws. The basic structure is outlined in the “Fundamental Law for establishing a Sound Material Cycle Society”, and in two general laws on waste management and recycling – “Waste Management and Public Cleansing Law” and “Law for the Promotion of Utilization of Recyclable Resources”. The rest of the package of six laws relates to specific issues such as containers and packaging, household appliances, construction materials, food, vehicles etc., including green purchasing.
6. Awareness raising among the general public, as well as the private sector has been strongly built into the initiative, in order to facilitate broader and deeper participation, particularly at the local level. Political leadership and strong commitment has also been mobilized to drive the initiative forward – from the prime minister and the national government ministries, down to prefectural governors and city/town mayors. The traditional collaborative relationships between industry on one hand and research institutions/universities on the other, have been further mobilized for Initiative. Several 'Centers of Excellence' have been set up to research on themes drawn from the Initiative. The Initiative places rightful emphasis on monitoring and evaluation. It outlines the kinds of indicators to be used and

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<sup>1</sup> COP7 Basel Convention, ministerial discussions on Global Waste Challenge

targets to be achieved. The key driver in the Initiative is 'Material Flow Accounts (MFA)' which looks into resource productivity (inputs), cyclical use rate (throughputs) and final disposal amount (outputs)

### Direction of Future Work

7. Various activities are being planned as a part of the follow-up to WSSD and the 10-Year Framework Programme for Sustainable Consumption and Production (Marrakech Process). Sustainable Consumption, Cleaner Production, and the Life Cycle Initiative as a binding factor for these two approaches, are at the heart of UNEP's contribution to that framework. Strengthened efforts to include waste prevention into sustainable consumption and production strategies of all stakeholders - business, in particular small and medium-sized enterprises, civil society (awareness raising and providing recycling facilities for households) and governments themselves (national and local sustainable procurement, 'green' and waste-free events and premises at international governmental levels) is part of the ongoing regional consultation process on the regional priorities for the Marrakech process. A second international review meeting will take place in Costa Rica, September 2005.

8. At a Ministerial Meeting on 3R, to be organized in Tokyo, Japan from 28-30 April 2005, host Japan will launch a '3R Initiative' that pursues globally, a sound material-cycle society through the 3Rs. More information on this is available online at – <http://www.env.go.jp/earth/3r/en/index.html>.

9. The success of the 3R initiative will largely depend on the right mix of policies and programmes implemented at the local level.<sup>2</sup> As the Japanese experience has shown, the key spheres of action will revolve around *governance* issues such as laws, legislation, rules and procedures; *education and awareness building* issues, targeting stakeholders in the public and private sectors, but also communities and consumers alike; *technology* issues, to ensure that industrial, manufacturing and market activities and technologies used have a minimum impact on the environment, and produce the least amount of wastes possible; and *financial* issues, focusing on subsidies and taxation to facilitate action in the right direction, and to discourage unsound practices.

10. Ultimately, the lifecycle of a product in itself should guide the action necessary to development and implement a comprehensive 3R Initiative based on integrated waste management systems:

- At the production and product design phase, businesses should utilize 3 (or 4) R oriented designing in order to save resources, expand life spans, durability and re-use, facilitate recycling, and provide appropriate information for labeling on the materials used, responding to 'producer responsibility' legislation or voluntary codes of conduct;
- Orienting the consumption/use phase of the life cycle a product can be focused on national and local authorities to take the lead in purchasing environmentally friendly products and services, as well raising awareness of individual consumers to take the waste aspect into account in their purchasing behavior (in particular focusing on avoiding unnecessary packaging);
- The post-consumption phase is critical, asking of consumers to contribute to recycling, repair and sorting schemes, put in place by business - including the retail sector - and (local) authorities.
- At the final stage of disposal, businesses and municipalities have the responsibility to ensure that waste products are properly collected, discharged and/or incinerated, minimizing environment and health risks, in particular for poor people.

11. Achieving success in 3R initiatives world-wide will depend on progress made with more general policies and frameworks on sustainable consumption and production, including elements such as:

- (a) Sustainable investment and pricing policies and practices, such as greener procurement, subsidies and eco-taxes, Socially Responsible Investment (SRI);
- (b) Production and distribution policies and practices, such as integrated product policy, life cycle analysis and life cycle management, extended producer responsibility, precautionary principle, polluter pays principle, eco-efficiency/ cleaner production, health and safety standards, optimizing of transportation, distribution and packaging activities; and
- (c) Sustainable consumption policies and practices, such as "right to know", consumer education and awareness, advertising and communication campaigns, eco-labeling and other consumer information tools.

<sup>2</sup> UNEP is also promoting the 'eco-town' concept, through which city planning is including 'zero emissions' and 'zero-waste' industrial development. At the end of 2002 the Japanese government has approved eco-town business projects in 17 municipalities, including in Kawasaki city and Kita Kyushu city. A demonstration project in Guiyang city, located in the Guizhou province of China, is being carried out to demonstrate the related "circular economy" concept.

## Ideas for projects on lifecycle economy

12. Table below highlights examples of potential projects in the area of lifecycle economy.

Activity description	Waste stream	Location	Ideas for external partners to consult/involve, including UNEP
<b>I. Responses to “hot spots”</b>			
Close dumps and replace by landfills, with job creation, in community-based approach	Household	10 pilot projects in Africa, Asia, Latin America, Eastern Europe	Private sector, World Bank, ISWA, development banks, local government, local communities, etc. <i>DPDL, DEPI</i>
Waste minimization and safe disposal projects for dismantling ships, e-waste, hexavalent chromium et c. To be decided with respective MEA's	Industrial	To be decided	MEA's, UNCTAD, NCPC's, private sector, national and local gvts. <i>DRC, DEC, SBC</i>
<b>II. Demonstrating “waste to energy” solutions</b>			
Landfill methane energy use with conventional technologies	Household	Countries with low caloric and high organic content of waste, landfills in planning or early construction phase	GEF, regional development banks, ISWA, carbon financiers, national govts, local municipalities, project developers, UNFCCC, <i>DRC</i>
Environmentally safe incineration and generate energy	Household; Industrial	Countries high-calorific waste content, matured waste management systems, established landfills	Commercial banks, local municipalities, UNFCCC, <i>DRC, Stockholm</i>
<b>III. Waste management infrastructure projects</b>			
Carry out waste campaigns directed at working with governments in different regions to implement integrated waste management strategies in regional partnerships, including voluntary web-based information sharing and reporting mechanisms.	Household	Asia, Latin America and Caribbean, Africa	National and local authorities, World Bank, regional development banks, ICLEI, bilateral aid agencies, <i>DRC</i>
Assist local governments using twinning approach with developed countries to set up small-scale waste collection, recycling, disposal facilities	Household	Africa as priority, Asia for recycling	Local municipalities, ICLEI, German DSD, EC, packaging industry etc., <i>DEPI, DRC</i>
<b>IV. Developing local markets for waste</b>			
Encourage development of markets for recovered materials from waste stream, and repair facilities	Household	Large municipality/mega-city	London Remade, municipalities, private sector, <i>DRC</i>
Increasing collection and separation of waste by piloting urban youth/women campaigns	Household	To be decided	UNESCO, UN Habitat, youth, consumer and women networks in developing countries, ICLEI, <i>DCPI, DPDL</i>
Developing, testing and implementing new financing mechanisms, such as micro credits, revolving funds, for local initiatives in waste management	Household	To be decided, pilot countries of CP Financing project.	Banks, national governments, bilateral aid agencies, <i>UNEP FI</i>
NCPC's waste management initiative to promote new SME opportunities for waste, including piloting “design for recycling” techniques, and promoting facilities for repair	Industrial	To be decided	NCPC's, UNIDO, Switzerland, UK, InWent, design institutes

Activity description	Waste stream	Location	Ideas for external partners to consult/involve, including UNEP
<b>V. Demonstrating closed loop economy concepts and waste prevention/recycling/reuse options</b>			
Develop and enforce legislation for waste-related MEA provisions and protocols	Household industrial	To be decided, eg. Regional Seas Convention	Convention secretariats, national governments, NGO's, DEC
Developing and piloting recycling society legislation for priority waste streams/goods (3 R projects)	Household industrial	To be decided	Japanese government,
Education, awareness raising, guidelines, training, networking (on local levels) on integrated waste management in selected areas, for selected target groups	Household industrial	To be decided, eg. on city level, for marine litter, retail trade, SIDS	Various, incl. UN Habitat
Demonstrate "waste free" (3R) UN events and facilities	Household	All major meetings organised by UNEP/UN (GC, WED)	UN procurement and events managers
Pilot task forces/projects to demonstrate the importance of life cycle assessment for integrated waste management (design, construction, maintenance, procurement, material flows, demolition)	Household; Industrial	To be decided	Various
Integrated circular economy projects for communities	Household; Industrial	2 in China, 2 in Brazil, 2 in S Africa (possibly one in SIDS)	EC, Japan, local governments, private sector, NCPC's
Integrated circular economy projects for industry sectors: collective waste treatment from SME's, for instance tanneries	Industrial	To be decided	NCPC's, industry sector associations, UNIDO
Integrated circular economy projects for industrial parks	Industrial	To be decided	Private sector, local governments, UNIDO
Integrated circular economy concept as support for MEA's. Including best practices sharing on waste management between MEAs (POPs, Montreal, Kyoto).	Industrial	To be decided	MEA secretariats, DEC
<b>VI. Improving global policy-making by practical lessons learnt</b>			
UNEP Governing Council. Include information on waste policy options in information document. Possibly followed up by international expert conference		Nairobi	National governments, UN DESA, UNEP OED, DRC
Sharing best practices for government officials on how to develop, implement and enforce legislation and economic instruments (relevant EC directives, Japanese Laws for Establishing Sound Material-Cycle Society and others)		To be decided, possibly through special taskforce in Marrakech process (see below)	National governments, including Japan, European Commission, DEC, DPDL
Ten-yr. framework on SCP (Marrakech process). Include consultations on waste policy options in agenda of existing/planned meetings on ten-yr. framework, at regional levels and international, promote establishment of waste management task forces and/or ten year activity plans on (solid) waste		Africa, Lat. America/Asia (2005), New York (Feb/April 2004), Costa Rica (Sep t. 2005)	UN DESA, UNEP NYO, lead and host countries