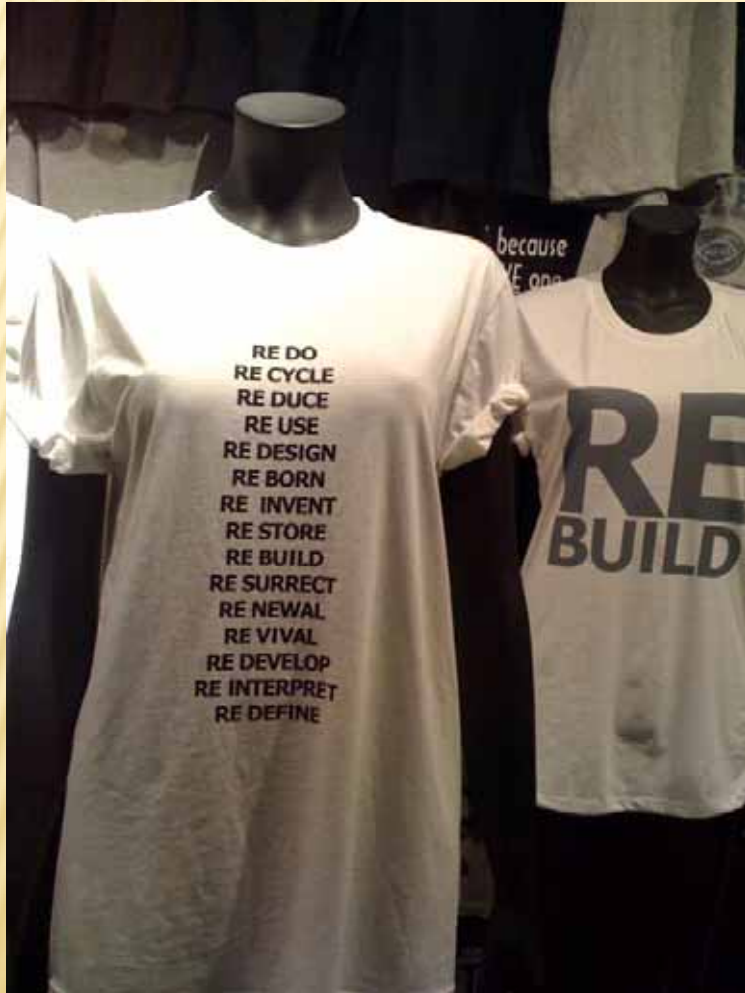


BEST PRACTICES AND AVAILABLE TECHNOLOGIES IN THE 3RS – ACHIEVING ECONOMIC GROWTH WHILE IMPROVING RESOURCE EFFICIENCY

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INTRODUCTION

- ✘ Decoupling economic growth from natural resource consumption and waste has become a priority for most countries in the Asia-Pacific region.
- ✘ The “reduce, re-use, recycle” (3Rs) approach is a key policy tool in achieving this outcome, and several countries have adopted national 3R strategies and related laws, regulations, and programs.
- ✘ UNIDO has launched a Green Industry Initiative which “foresees a world where industrial sectors minimize waste in every form, utilize renewable resources as inputs materials and fuels, and take every possible precaution to avoid harming workers, communities, climate or the environment”—the very essence of the 3Rs approach

INTRODUCTION (CONT.)

- ✘ Technology for 3Rs applies at all stages of the product cycle, from design, manufacture, by-products and waste minimization in the manufacturing stage, and purchasing, use, and disposal on the part of consumers.
- ✘ Governments have a particular role in legislation and policy, setting standards, reducing subsidies for environmentally unsound practices, implementing green procurement, and coordinating waste disposal practices.
- ✘ Governments can also help to close the loops between producers and consumers through new business opportunities such as UNIDO's chemical leasing approach, where businesses sell the services provided by chemicals, thus reducing ineffective use and overconsumption of chemicals and adding to bottom line profits.

3RS TECHNOLOGIES AND RESOURCE EFFICIENCY

- ✘ At the heart of the 3Rs approach is a belief that sustainable development is only approachable through dematerialization of economic activities (i.e. decoupling energy and materials use from economic growth) and preservation of natural capital
- ✘ Relative decoupling (lower resource or environmental impacts than the relevant economic indicator) is distinguished from the more difficult to achieve absolute decoupling (where “resource use declines, irrespective of the growth rate of the economic driver”)
- ✘ The urgency - achieving US or European standards of living globally without changing existing production and consumption patterns would require 2-3 additional planets to provide the necessary resources

3RS TECHNOLOGIES AND RESOURCE EFFICIENCY

- ✘ Resource productivity focuses on new technology to reduce material inputs while generating the same or even better services from the outputs.
- ✘ Resource usage due to production and consumption is a proxy for environmental pressures, so households are both victims of environmental hazards, as well as co-producers.
- ✘ A focus on resource efficiency needs to examine which sectors are most responsible for material extraction, energy consumption and land use, and the resulting environmental degradation from production and consumption.
- ✘ In most economies, the construction and housing, food, and transport sectors account for nearly 70% of material, energy, and land use, so these sectors should be prime targets for innovative technology to achieve resource efficiency.



Some Typical Technologies

- × Nanotechnology
- × Organic/green chemistry
- × Biotechnology
- × Information technology for eco-labeling
- × Eco-efficient transport/electric cars
- × Car-share technologies
- × Mass transit
- × Renewable energy
- × Household water saving devices

REDUCE

Some Typical Technologies

Information technology – eBay, PayPal

Exchangeable/reusable parts

Multi-purpose design

Antiques/Thrift Stores

Containers (e.g. glass bottles)

Used cars, cell phones etc.

Used book sales, sharing schemes, leasing



REUSE



RECYCLE

Some Typical Technologies

- ✘ Composting
- ✘ Urban mining
- ✘ Recycled building materials
- ✘ Waste recycling systems
- ✘ Eco-design
- ✘ E-waste recycling of rare minerals
- ✘ Waste to energy
- ✘ Household appliances
- ✘ Paper and cardboard recycling

ECONOMIC AND OTHER BENEFITS OF 3Rs TECHNOLOGIES

- ✘ In the US recycling and remanufacturing industries alone account for about one million manufacturing jobs and at least \$100 billion in revenue.
- ✘ Investments in collection and recycling equipment have flow through multiplier effects on the economy, employment, environmental protection, and contribute to economic growth.
- ✘ For companies, the benefits of a 3Rs approach are reflected in the triple bottom line, with higher resource efficiency generally providing direct financial benefits and adding to profitability.
- ✘ Households benefit from the shift away from uncontrolled landfills as the dominant waste disposal technology. Property prices are severely affected by proximity to a landfill site, with the disamenity cost ranging between \$3.05 to \$4.39 per compacted tonne of garbage.
- ✘ Climate change benefits from improved waste management are due to avoided landfill emissions, reduced raw material extraction and manufacturing, recovered materials and energy replacing virgin materials and fossil-fuel energy sources, carbon bound in soil through compost application, and carbon storage due to recalcitrant materials in landfills.
- ✘ In rural areas, 140 billion t/yr of biomass (equivalent to about 50 billion tonnes of oil) represents a huge, largely neglected, opportunity to recover energy and raw materials from waste.

CASE STUDIES

- × Japan – Sound Material Cycle Society – how legislation and government policies in conjunction with voluntary efforts by business are driving technology development;
- × Green Chemistry – looking to nature to find environmentally sound and profitable chemical substitutes for toxic and hazardous materials;
- × Municipal Solid Waste Management Technologies – progressive technological improvement in capturing energy and recovering materials from municipal waste, combined with changes in consumer behavior; and
- × Information Technologies for 3Rs – new opportunities opening for 3Rs from emerging information and communication technologies and resulting social networks.

BEST PRACTICE POLICY TO PROMOTE 3Rs TECHNOLOGY TRANSFER, ADAPTATION AND DIFFUSION

- ✘ Taxes and charges – e.g. pollution fees, landfill charges, volume-based waste fees, carbon taxes, environmental taxes, luxury goods taxes, value added tax;
- ✘ Subsidies and tariffs – e.g. export and import tariffs on energy-intensive products, removal of fossil fuel subsidies, rebates for green procurement;
- ✘ Standards and target setting – e.g. mandatory targets specified in cleaner production or energy efficiency laws, voluntary targets by business associations;
- ✘ Information-based policies – e.g. independent certification, eco-labeling, product content and production information, independent testing and verification, producer and consumer education, and social marketing; and
- ✘ Technology research and development - e.g. National Cleaner Production Centers in 47 countries, Blue Economy database.

RECOMMENDATIONS

- ✘ Recommendation 1 – The 3Rs should be mainstreamed into the national development agenda, including environmental, social, and economic plans, policies, strategies and programs;
- ✘ Recommendation 2 – Developing countries should mobilize additional financial resources in cooperation with bilateral and multilateral donors for the implementation of 3R activities, including the transfer of modern technologies and associated capacity strengthening;
- ✘ Recommendation 3 – Build adequate technical and human resource capacity for collection and safe treatment of toxic and hazardous wastes, including household waste, medical waste, and e-waste;
- ✘ Recommendation 4 – Consider development of eco-industrial zones and clusters to strengthen industrial capacity for recycling, where waste from one enterprise becomes a resource for another; and
- ✘ Recommendation 5 – Develop and transfer environmentally sound technologies for waste management and the 3Rs, from wherever they are developed, and use these technologies to create new, entrepreneurial businesses that can compete on the global stage.

RECOMMENDATIONS (Cont.)

- × Recommendation 6: The various 3R knowledge portals in Asia-Pacific should cater to the needs of developing countries for 3R related technologies, and link with relevant websites in other regions;
- × Recommendation 7: A regional, multi-donor 3R Fund similar to the Climate Investment Funds, should be initiated specifically for preparation and implementation of national 3R action plans;
- × Recommendation 8: Use the proposed 3R Fund, or some other financial mechanism, to compensate the holders of intellectual property rights of crucial 3R-related technologies for foregone revenues, voluntarily waived, to facilitate acceleration adoption of the 3Rs in developing countries; and
- × Recommendation 9: Governments, of both developing and developed countries, should refrain from fiscal stimulus packages that promote unrestrained consumption, by earmarking most of the stimulus funding for environmental technologies and infrastructure.

CONCLUSION

- ✘ Industrial revolutions do not take place in a few short years and there is emerging evidence that human ingenuity will continue to provide technological advances that will make the world of tomorrow very different from the single throughput, mass consumption economy spawned by the Industrial Revolution.
- ✘ Developing countries have the potential to leapfrog over old, outdated technologies and adopt innovative technologies based around the 3Rs.
- ✘ Continued monitoring and dissemination of the best practice technologies to implement the 3Rs approach will help to ensure that the 3Rs will take their rightful place in the next industrial revolution.

THANK YOU FOR YOUR ATTENTION



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