



UNIDO Green Industry Initiative



Resource Efficient and Cleaner Production:

A global Green Industry success story

Resource Efficient and Cleaner Production (RECP) is concerned with the efficient use of materials, water and energy by enterprises and other organizations and the minimization of their wastes, effluents and greenhouse gas (GHG) and other emissions. Numerous businesses globally have demonstrated that this makes good business sense, and benefits the health and safety of workers and communities. This confirms that the greening of industrial development has triple bottom line development benefits and contributes towards the practical realization of Green Economy and Green Growth.

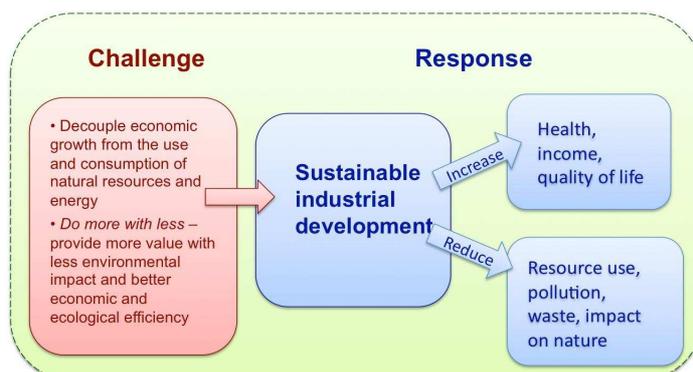
Green Industry

Green Industry (GI) is based on proven methods, strategies and tools and ultimately endeavours to decouple economic growth from increased use of natural resources (*resource decoupling*) and aggravated environmental impacts (*impact decoupling*). It provides a two-pronged approach for industrialization that is robust in the context of worsening environmental degradation, climate change and natural resource constraints:

- Firstly, through the '*greening of industries*', GI achieves on an ongoing basis reductions in the use of materials, energy and water and of the generation of wastes and pollution in any business, in particular through such proven approaches as cleaner production, industrial energy efficiency, and chemicals management.
- Secondly, through the creation of '*Green Industries*', GI realizes the supply of high quality environmental goods and services in an effective and industrial manner, including for example for renewable energy, waste recycling and resource recovery, and environmental advisory services.

GI is best understood as the sector strategy for achieving Green Economy and Green Growth in the manufacturing and related productive sectors.

Decoupling - producing more with less



We need to decouple economic growth from the increased use of materials, energy and water so that we can provide more value with lower resource use and lower environmental impact. That combines better economic and ecological efficiency.

We need to foster the greening of industries so that industries continuously improve efficiency in their use of materials, energy and water.



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Industry Examples

Peru

Metalexacto is smelting and refining used lead from acid batteries to obtain a refined secondary lead / antimony alloy. The key benefits achieved after applying RECP measures include the additional recovery of 34.7 tons /year of lead (USD 17,000), improvement in working practices and a reduction of energy use and associated greenhouse gas emissions.

Kenya

Chandarias Industries Ltd is a leading manufacturer of paper products in Nairobi. It recycles waste paper and blends with virgin pulp for various tissue products. It also recycles cotton fibres into absorbent cotton wool. RECP practices have improved operations through efficient resource use and improved environmental performance, contributing towards sustainable development and achieving annual savings of 0.635 million USD.

Sri Lanka

Rathkerewwa Desiccated Coconut Industry has applied RECP practices to reduce raw material and water consumption by respectively 390 tons & 5,400 kl/year. The company also implemented energy efficiency measures and started to use waste coconut shells as fuel to replace fossil fuel and curb greenhouses gas emissions. It also recovered most of the oil previously discharged with waste water thus reducing the total pollution load.

Tunisia

Société Nouvelle de Boissons, a leading carbonated soft drinks producer, with production of 635,000 hl/year, made an investment of USD 29,200 to achieve annual total savings of USD 194,600 on electricity, natural gas, water, raw materials and product. The pay-back period is less than 2 months.

India

45 industries producing dyes & other chemicals in Gujarat state have formed an equity company to recover spent sulfuric acid using cleaner technology based on concentration and thermal cracking. 2,000 tons are recycled yearly to be sent back to production at constant price and 85,000 tons of previously generated solid waste are avoided.

National Cleaner Production Centres and Programmes

UNIDO in collaboration with the United Nations Environment Programme (UNEP) has supported since 1994 the creation of National Cleaner Production Centres and Programmes (NCPCs) in 50 developing and transition countries.

These work to adapt and promote RECP, through core activities such as:

- information dissemination and advocacy;
- professional training;
- in plant assessments and demonstrations;
- policy advice; and
- support for technology transfer.

In 2010, the global RECP network (RECPnet) was created to improve networking and best practice sharing between NCPCs and other providers of RECP services.





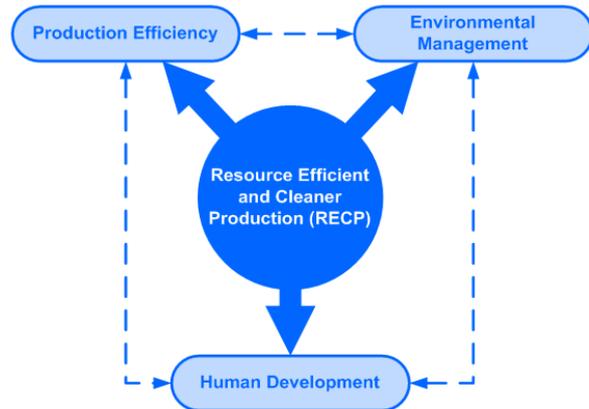
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Resource Efficient and Cleaner Production (RECP)

RECP refers to the continuous application of preventive environmental strategies and total productivity methods to processes, products and services to increase efficiency and reduce risks to humans and environment. RECP achieves the three sustainability dimensions individually and synergistically:

- **Production Efficiency:** optimization of the productive use of natural resources (materials, energy and water);
- **Environmental Management:** minimization of impacts on environment and nature through reduction of wastes and emissions;
- **Human Development:** minimization of industrial and chemical risks to people and supporting their development.



Several complementary techniques or practices are possible, ranging from low or even no cost solutions to high investment, advanced clean technologies:

Good Housekeeping	Appropriate provisions to prevent leaks and spills and to achieve proper, standard operation and maintenance procedures and practices
Input Material Change	Replacement of hazardous or non-renewable inputs by less hazardous or renewable materials and energy or by materials with a longer service life-time
Better Process Control	Modification of the working procedures, machine instructions and process record keeping for operating the processes at higher efficiency and lower rates of waste and emission generation
Equipment Modification	Modification of the production equipment so as to run the processes at higher efficiency and lower rates of waste and emission generation
Technology Change	Replacement of the technology, processing sequence and/or synthesis pathway in order to minimize the rates of waste and emission generation during production
On-Site Recovery/Reuse	Reuse of the wasted materials in the same process or for another useful application within the enterprise
Production of Useful By-Products	Transformation of previously discarded wastes into materials that can be reused or recycled for another application outside the company
Product Modification	Modification of product characteristics in order to minimize the environmental impacts of the product during or after its use (disposal) or to minimize the environmental impacts of its production



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Global RECP Programme

The joint global UNIDO-UNEP Programme aims to scale-up and mainstream RECP activities and results, nationally, regionally and globally. Principal intervention modules are aimed at: strengthening and expanding the RECP service delivery network; targeted and enhanced contributions of RECP to thematic progress on resource efficiency, waste minimization and safe and responsible production; improved policy and financing incentives; and innovation support.

With funding support from the Government of Switzerland, UNIDO started delivery of programmatic activities for:

- **Operational Support for RECPnet** to consolidate and extend the membership base, start service delivery to members and undertake global advocacy;
- **Knowledge Management** putting in place the software platform and management system to disclose RECP information and knowledge of network members at global and regional level;
- **Eco-Industrial Parks** aimed at geographically scaling-up RECP applications in clusters/zones of co-located enterprises through both single-enterprise efficiency and multi-enterprise cluster opportunities;
- **Methods and Tools** supporting the scaling up of RECP applications in industry sectors through the development and trial of best practice and novel methods and tools;
- **Industrial Waste Minimization for Low Carbon Production** working towards zero waste practices and technologies in waste-intensive sectors of industry, in particular for reducing and recovering organic wastes and processing residues;
- **Safe and Responsible Production** working towards safe and responsible practices and technologies for chemical-intensive sectors, including synthesis, formulation and application of chemicals;
- **Financing Instruments** assessing and promoting innovative financing instruments for mainstreaming RECP into enterprise finance.
- **Innovative Business Models** promotion of service-based business models (including chemical leasing) that reduce investment burden on SMEs for innovative RECP practices and technologies.

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