



# Green Industry

## Application of Cleaner Production by SMEs

Dr. Heinz Leuenberger, October 2010



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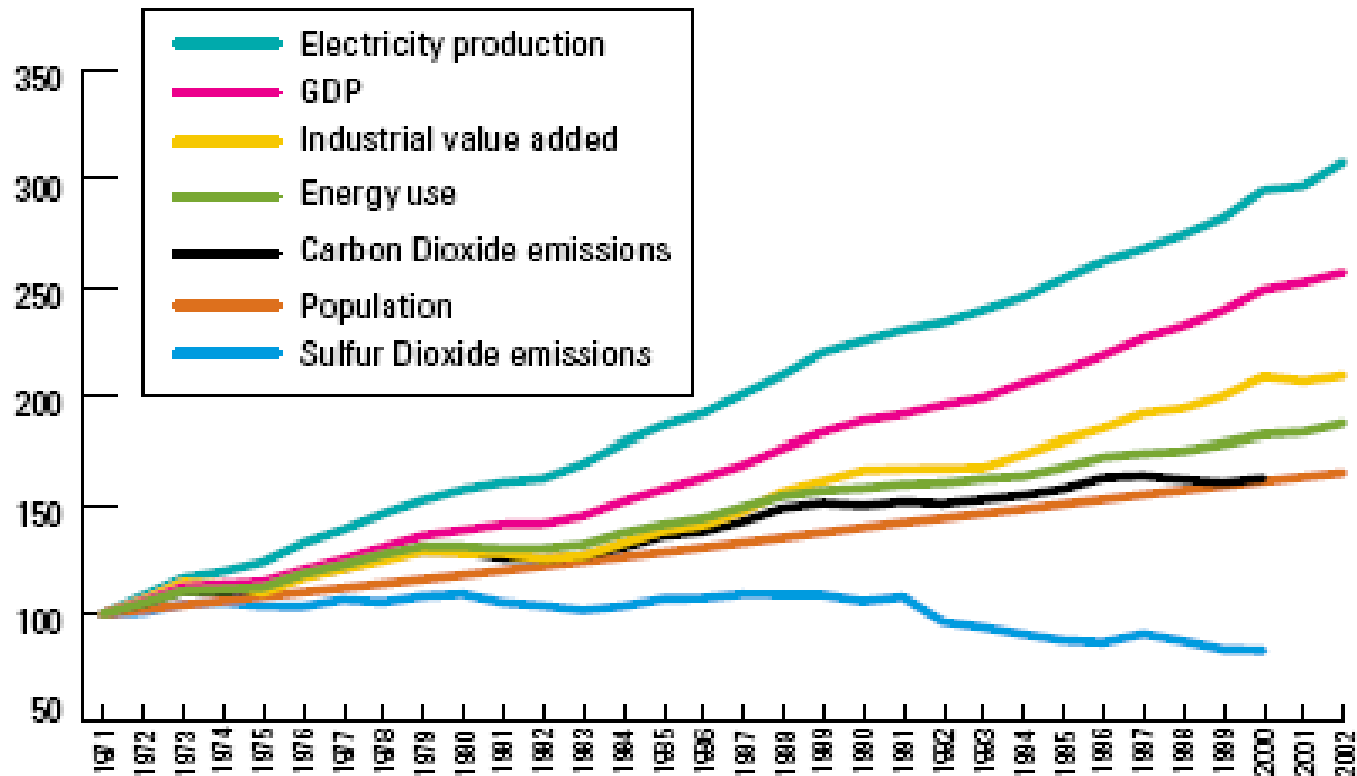


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## Global Trends: Growth in economy, energy and emissions



Note: Index: 1971=100

Source: UNDESA-DSD, based on data from World Bank, World Development Indicators 2005, and Stern, D., 2005.



## Context

- **Many industries use more materials and energy than their production processes require, due to continued use of obsolete and inefficient technologies and methodologies.**
- **In general, producers and consumers have adopted patterns of production and consumption that do not take into consideration the limits of the planet's available resources and its assimilative capacity for emissions, a situation further complicated by continued population growth.**
- **Climate change is one main consequence but air pollution, groundwater pollution, gaseous pollution etc are also important.**
- **Current production systems are therefore unsustainable: they do not allow today's needs to be met without jeopardizing the ability of future generations to meet theirs.**



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## Context

- **At the enterprise level, global competition, trade requirements and best practices are leading enterprises to establish good industrial relations, improve working conditions and develop their human resources.**
- **Pressure is also coming from major lending institutions as well as investors, which are adopting performance standards on environmental and social issues.**
- **Government procurement is another source of pressure, by increasingly requiring enterprises to meet environmental and occupational health and safety standards.**

Source: State of the world, 2008

Innovation for a Sustainable Economy, Worldwatch Institute



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## Global context

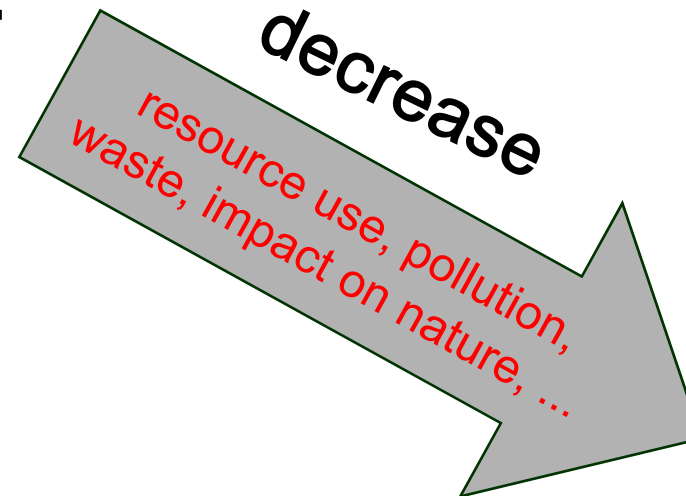
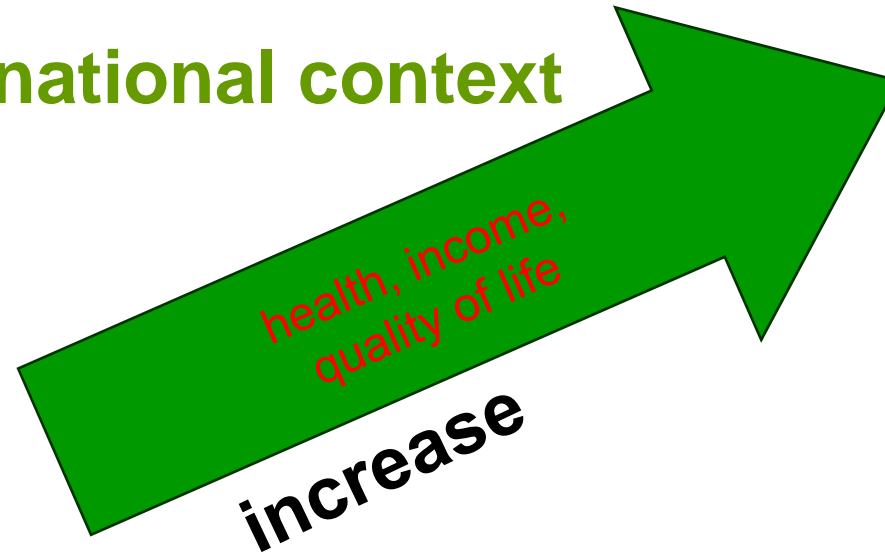
- Greenhouse Gas emissions  
2,5 to 3-fold increase by 2050
- Ecological footprint  
EU 2,5 earths; USA 4,5 earths
- Metals and minerals consumption  
35-40% growth in 10 years
- Metal consumption in China  
200-300% growth in 10 years



## Challenge of the international context

**Sustainable  
Industrial  
Development**

**should:**



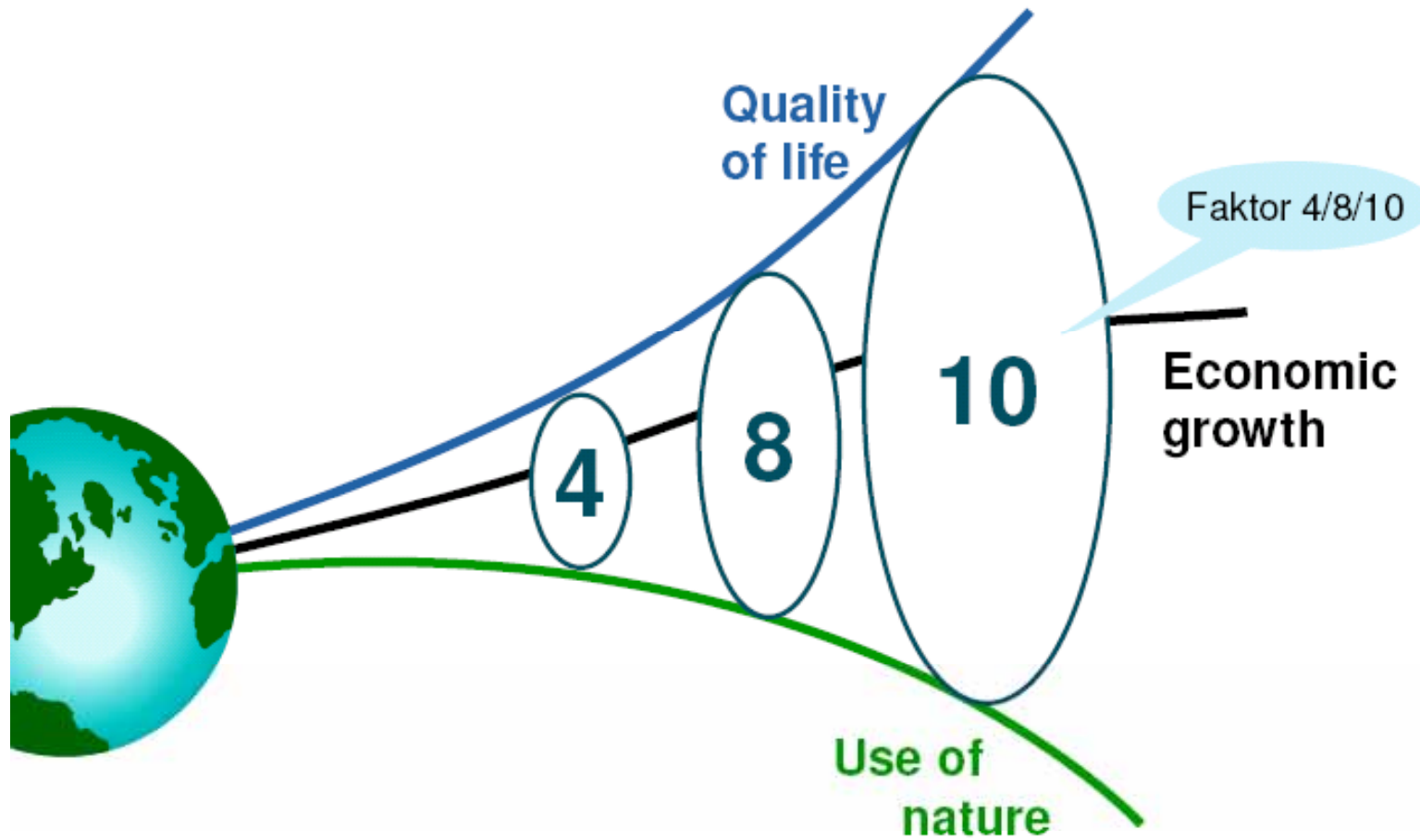


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# Eco-efficiency



Source: Wuppertal Institute Collaboration Centre on SCP, 2006





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## The global challenge

- To provide more **value** with less environmental **impact**
- To **de-link** advances in welfare from the natural resource use
- To improve both **economic** and **ecological efficiency**

= **ECO-EFFICIENCY**

(Dematerialization of our society)



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## Green Industries

- **Greening Industries** = any industry that commits itself to reducing the environmental impacts of its processes and products through resource efficiency, environmentally sound management of chemicals, integrated waste management, substitution of fossil fuels through renewable energy, eco-design of products and is actually doing so on a continuous basis (by this definition, all types of industries can be green)



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## Green Industries

**Green Industries** = industries in the environmental goods and services sector

- materials recovery and recycling companies,
- waste treaters (e.g., incineration companies), waste disposers (e.g., landfill companies), waste transporters, environmental consultants, engineering companies specializing in wastewater treatment, air pollution control, waste treatment equipment, companies manufacturing and installing renewable energy equipment, energy consultants, ENSCOs, labs specializing in environmental measurement and analysis,
- companies that specialize in manufacturing clean or cleaner technologies..

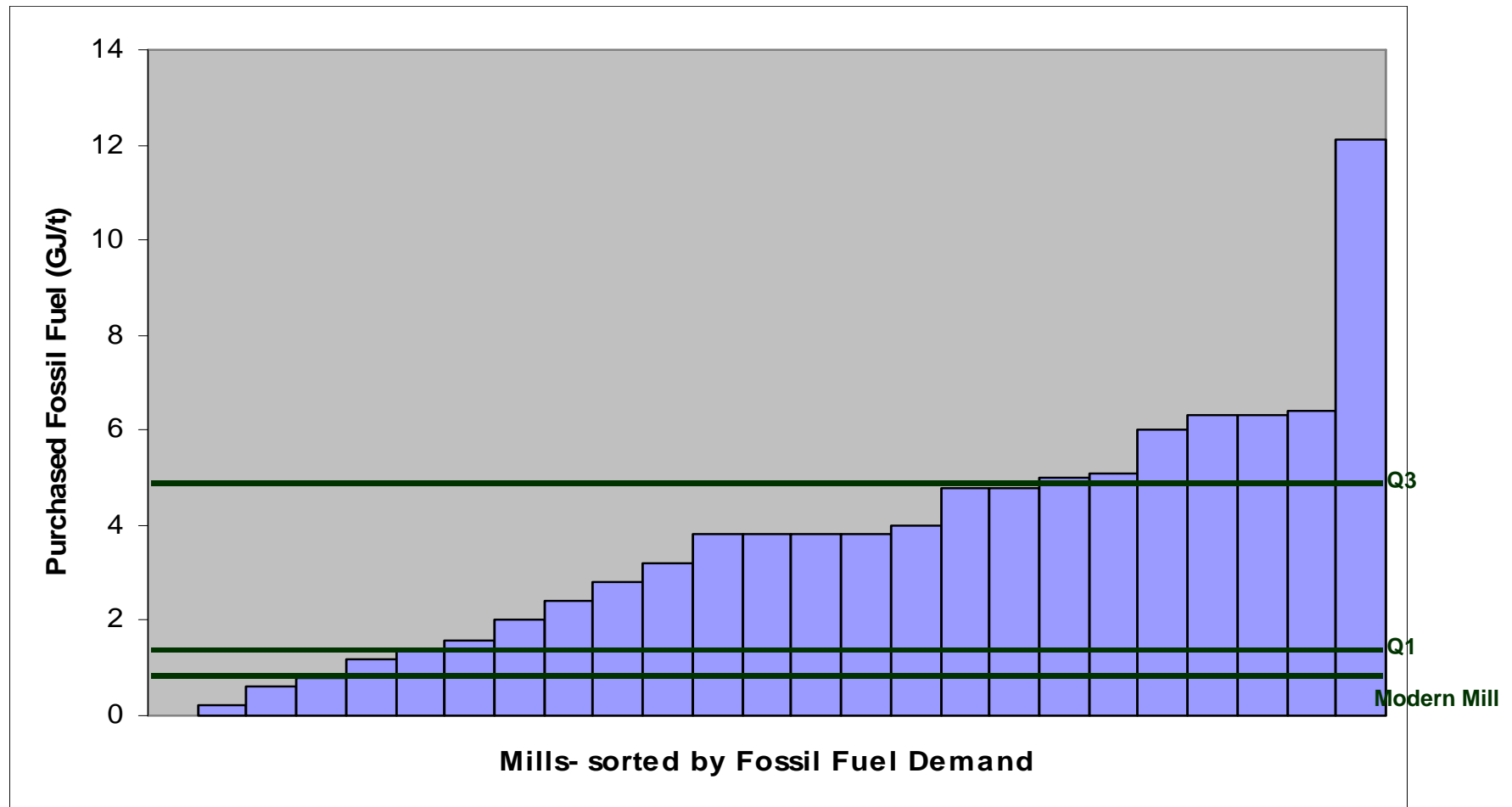


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## Purchased Fossil Fuel Demand- newsprint mills





## Unit consumption of water (2001)

### Pulp and paper Industry

Unit: m<sup>3</sup>- water/ton-pulp or paper

<b>Item</b>	<b>Paper</b>	<b>Low</b>	<b>High</b>	<b>Average</b>
<b>Pulp</b>		<b>48.1</b>	<b>75.8</b>	<b>65.9</b>
<b>Packaging paper</b>	<b>Liner board</b>	<b>6.9</b>	<b>21</b>	<b>10.9</b>
	<b>Fluting paper</b>	<b>6.8</b>	<b>49.6</b>	<b>9.9</b>
	<b>Coated white board</b>	<b>13.3</b>	<b>51.5</b>	<b>27.8</b>
	<b>Chip board</b>	<b>9.6</b>	<b>51.5</b>	<b>34.1</b>
	<b>Kraft paper</b>	<b>27.5</b>	<b>90</b>	<b>59.9</b>
	<b>Art Paper</b>	<b>3</b>	<b>15.7</b>	<b>12.1</b>
	<b>Printed writing paper</b>	<b>15.7</b>	<b>98.2</b>	<b>30.9</b>
<b>Household paper</b>		<b>16</b>	<b>83</b>	<b>32.5</b>

Source: C.Y. Peng, 2006: Water Consumption, Quality Demanded, and Re-use of the Treated Wastewater for Paper Industry



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## Electricity efficiency - Cement

<b>Electric energy consumption for cement manufacture</b>	<b>kWh/t cement</b>
10 <sup>th</sup> percentile mills	89
Global weighted average	111
90 <sup>th</sup> percentile mills	130

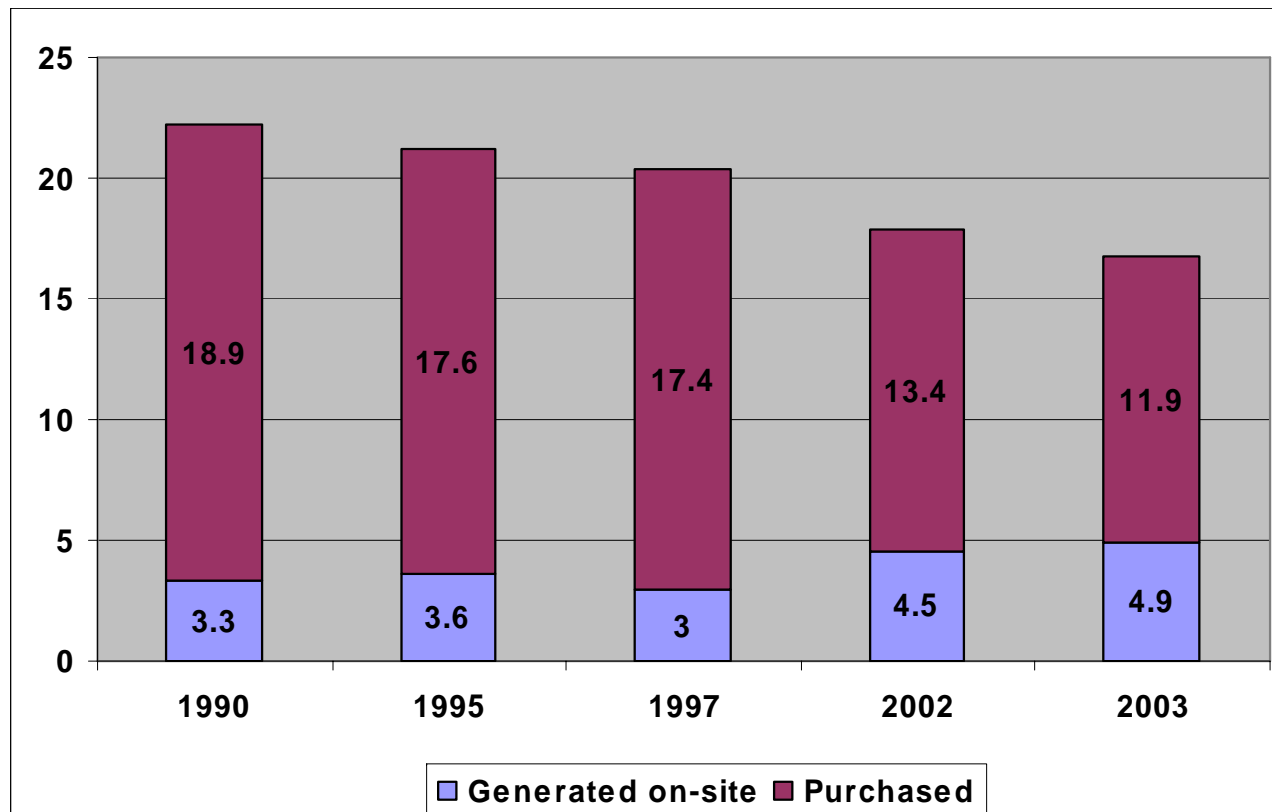
*Note:* Figures are for blended and Portland cement

*Source:* Getting the Numbers Right data 2006, WBCSD



## Energy Consumed by Australian Paper Manufacturers

(GJ/Tonne of production)

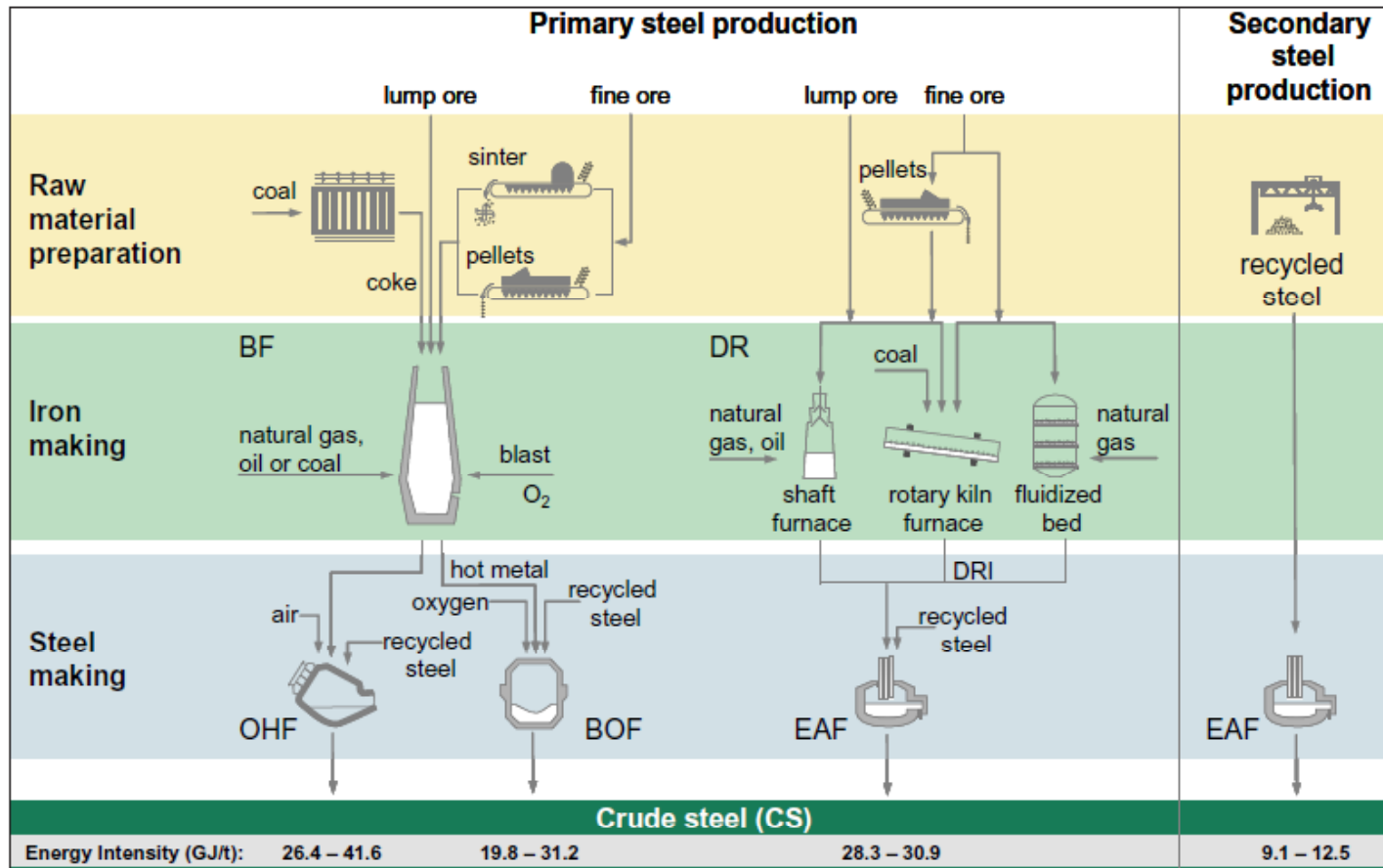


Source: Australian Paper manufacturing



## Energy intensity of various steel-making processes

Source: Factor V

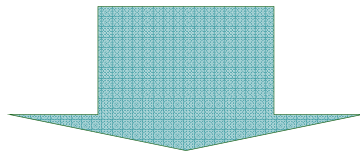




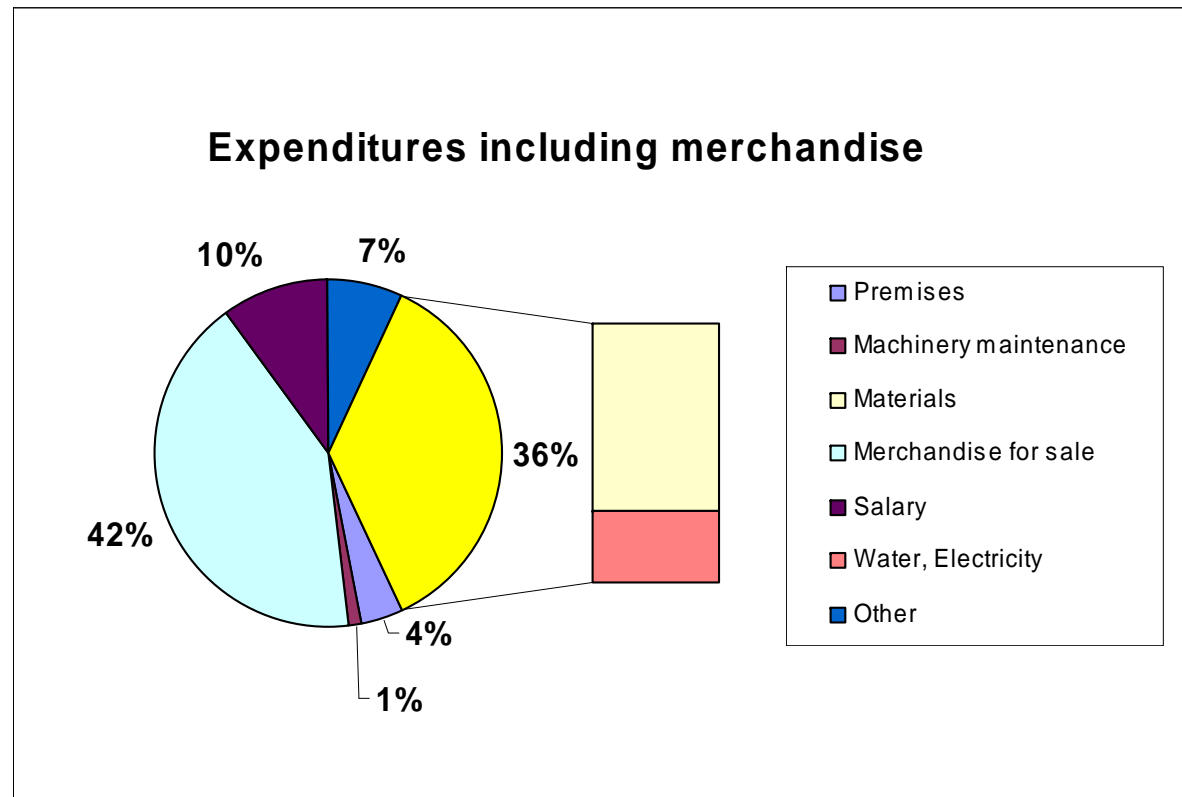


# SME in developing countries

**Cost structure of micro-enterprises in Mexico: Costs of material & energy 3.6 as high as salaries paid**



**Resource efficiency can strengthen local enterprises**





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## Why Resource-efficient and low-carbon Industries?

- **Decoupling economic growth from consumption of natural resources**
  - Reduce material and energy intensity (increase eco-efficiency)
  - Reduce carbon footprint (climate change)
  - Reduce environmental pollution (air, water pollution etc.)
  - Reduce dependency on scarce materials, fossil fuels, water
- **Increase efficiency, productivity and improve competitiveness of companies**
- **Create new market opportunities for companies**
- **Create new jobs**
- **Prerequisite for sustainable growth and industrial development**



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# Definition of Resource Efficient and Cleaner Production

**“Continuous application of an integrated preventive environmental strategy to processes, products and service to increase efficiency and reduce risks to humans and environment”**

It specifically works to advance:

*Production efficiency* through improved productive use of natural resources by enterprises

*Environmental conservation* through minimization of the impact on nature by enterprises

*Human development* through reduction of risks to people and communities from enterprises and supporting their development



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# Joint UNIDO-UNEP Programme on Resource Efficient and Cleaner Production

Environmental Management Branch (UNIDO)

and

Sustainable Consumption and Production Branch  
(UNEP)



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## NATIONAL CLEANER PRODUCTION CENTRES AND PROGRAMMES



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# Results of CP Programme/1

- Establishment and operation of 42 National Cleaner Production Centres and Programmes worldwide, which offer the following basic services:



- CP awareness raising and information dissemination
  - Training for specific target groups
  - Technical assistance at plant level
  - CP policy advice
  - EST development and transfer
  - Promotion of CP investment and business cooperation
- Establishment of a Regional Cleaner Production Programme in Latin America, with 12 participating countries and development of an Internet-based Knowledge Management System
  - Bolivia, Brazil, Colombia, Costa Rica, Cuba, Ecuador, El Salvador, Guatemala, Honduras, Mexico, Nicaragua, Peru



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## Results of CP Programme/2

- Development of a UNIDO CP training toolkit and UNIDO endorsed CP award for consultants, trainers and companies
- Development of technical tools and delivery of training to NCPCs by UNEP on CP and Energy Efficiency, CP and MEA implementation and Design for Environment/ Sustainability (D4E/D4S)
- Inclusion of activities related to UNIDO's Sustainable Chemicals Management and Chemical Leasing in the portfolio of several Cleaner Production Centres
- Facilitation of regional and national roundtables on cleaner production/sustainable consumption and production

## Lessons Learned CP Network

- 2007/8 evaluation confirmed in:
  - Putting CP on the agenda of businesses and government
  - Training of professional CP auditors
  - Implementation of CP options in companies, Case studies
  - Policy change and technology transfer in several countries continued and rising relevance and potential for greater impact
  
- Requires a consolidated programmatic approach that:
  - Aligns CP with global concerns on resource use and climate change
  - Scales-up and mainstreams CP to facilitate transition towards sustainable industrial system





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## Lessons learned: Company level

- RECP Institutions lack state of the art professional and technical know how
- Commitment of Management is a prerequisite for RECP introduction
- Clear, correct baseline is lacking, economic and environmental benefits not quantified and documented
- No Indicators for Resource productivity in SMEs
- Follow up activities are missing, RECP not a continuous process
- Capacity building in the company for RECP productivity is weak



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## Programmed Objective

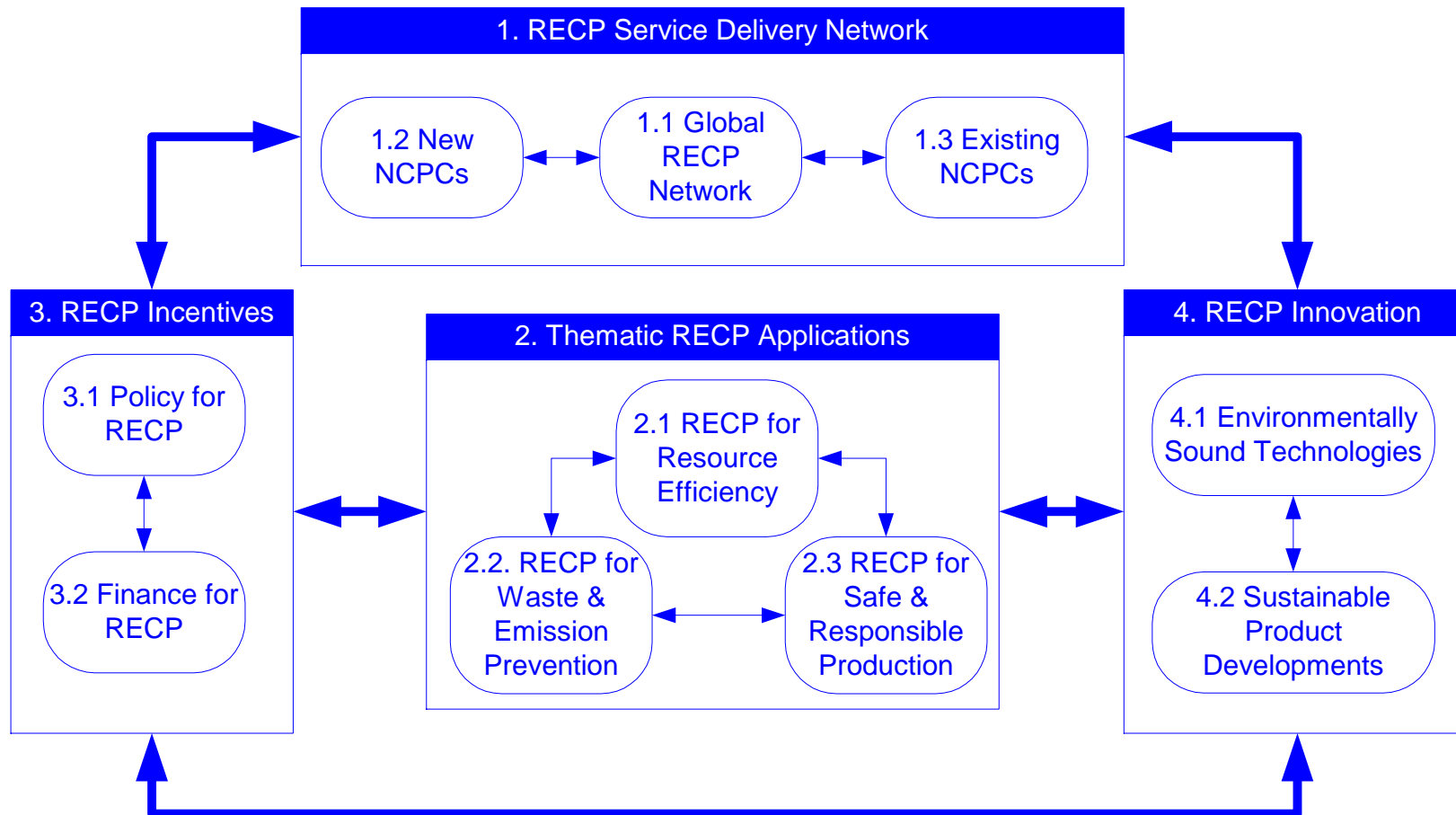
- Improve *resource productivity* and *environmental performance* of businesses and other organisations
  - and thereby contribute to sustainable industrial development and sustainable consumption and production in Programme countries
  
- Aspects:
  - *Environment:*
    - reduced environmental footprint of the business sector
  - *Economy:*
    - increased resource productivity and reduced operational and/or compliance costs to the business sector
  - *Policy and Institutional:*
    - conducive policies and regulations combined with existence of a strong custodian for RECP at the national level
  - *Technology and Finance:*
    - enhanced assimilative capacity for ESTs and sustainable products with financing mechanisms



# Programme Components

- RECP Services delivery network
  - International and regional networking
  - Development of new RECP service delivery capacity
  - Up-scaling RECP through existing (N)CPCs
- Thematic RECP applications
  - Resource efficiency (energy, water, materials)
  - Waste/pollution prevention
  - Corporate responsibility
- RECP Incentives
  - Mainstreaming CP in policy and enterprise finance
- Innovation Capacity
  - Adaptation and replication of ESTs and sustainable product developments

# Programme Modules



## RECP-NET

# RECP Global Network

## ■ RECP NET

- Not-for-profit initiative to bundle and utilize existing capacities of NCPCs and RECP service providers
  - Charter and supportive by-laws on membership and code of conduct developed and agreed upon
- Objectives
  - Enable and contribute to effective RECP promotion and implementation
  - Foster North-South and South-South collaboration and transfer of methods, policies and technologies
- Functions
  - Innovation and knowledge management
  - Capacity building
    - Technical and Institutional Excellence and Leadership
  - Advocacy
  - Quality control and branding

## Outlook: RECP

- *Moving Forward: main challenge*
  - *Scale-up and mainstream RECP!*
    - *“Turn RECP from a leading practice adopted by selected leading enterprises to a common practice of the vast majority of enterprises”*
  - Critical elements
    - Give strategic priority to RECP in national development policy and international collaboration
    - Develop, implement and enforce policies and regulations
    - Make technology, products and finance available
    - Use available resources and experiences, including NCPCs and RECP Network



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Thank you for your attention!