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Green Industry

Zero Waste and Resource Productivity

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17 October 2011



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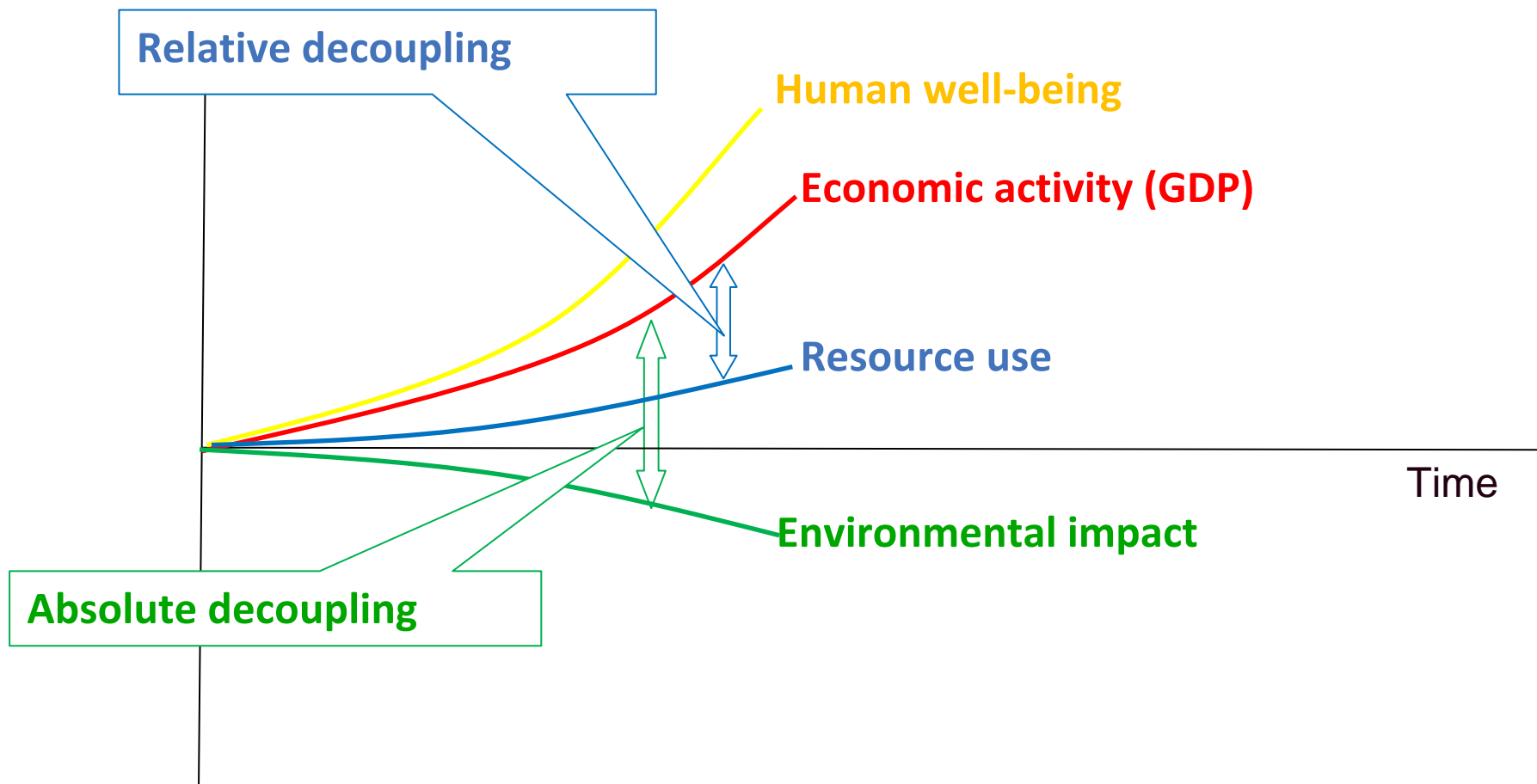
Resource Use and Resource Efficiency in the Asia Region



Context: Decoupling

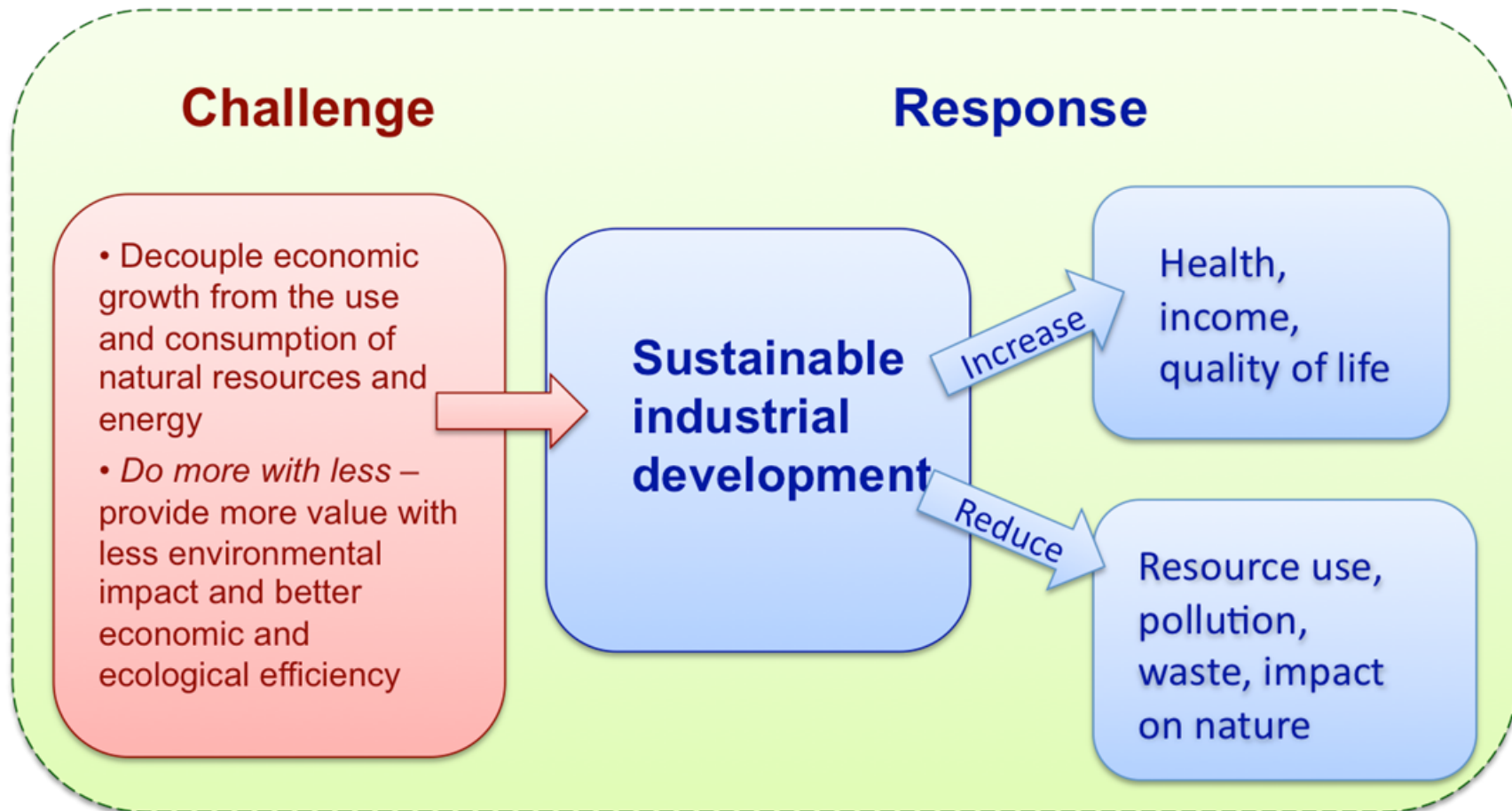
- At the heart of 3Rs: a belief that sustainable development is only possible through decoupling energy and materials use from economic growth and preservation of natural capital.
- Decoupling is urgent. Achieving US or European standards of living globally without changing existing production and consumption patterns would require 3-5 additional planets to provide the necessary resources and ecosystems services.
- We must distinguish relative decoupling (where resource or environmental impacts grow slower than the relevant economic indicator) from the more difficult to achieve absolute decoupling (where resource use declines, irrespective of the growth rate of the economic driver).

Two aspects of “decoupling”

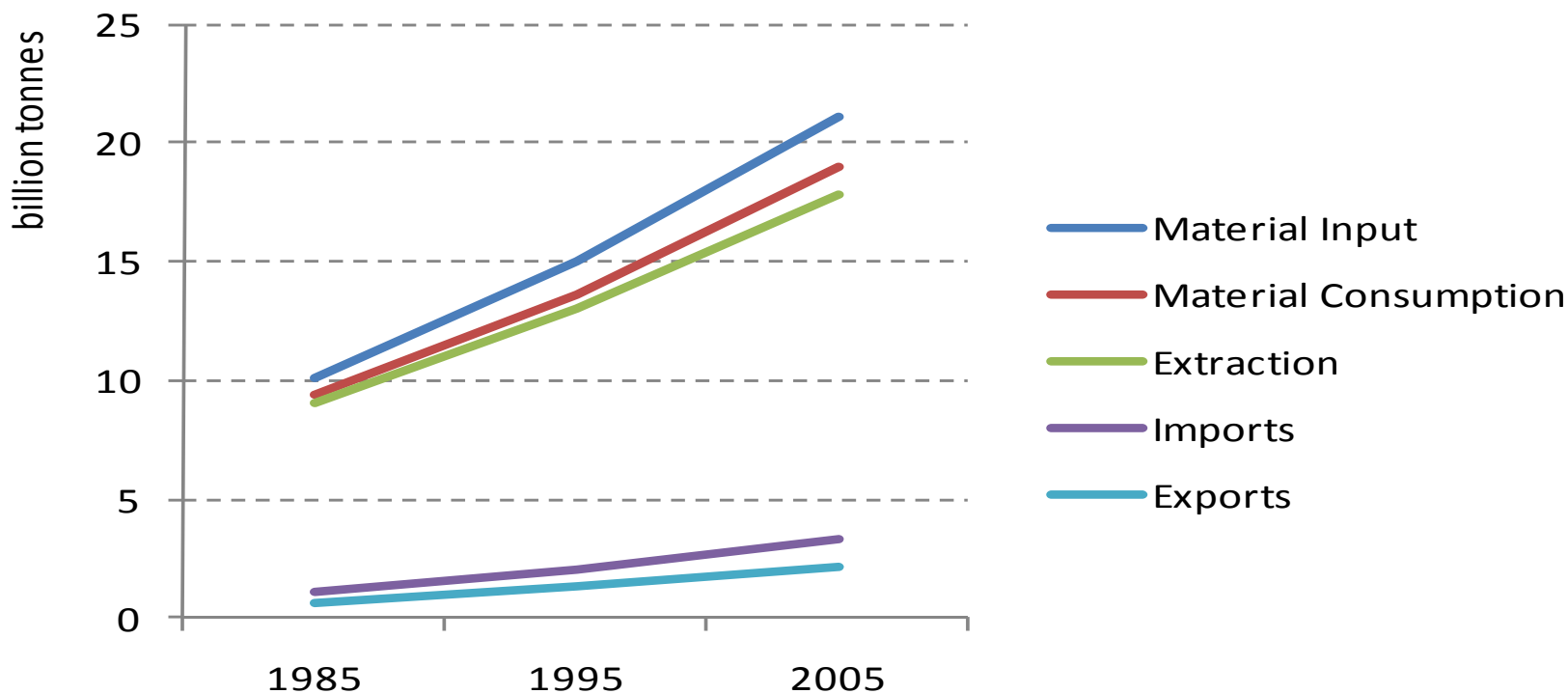


Source: International Resource Panel-
Decoupling natural resources use and environmental impacts from economic growth ,2011

The Challenge for Industry



Trends in Asia

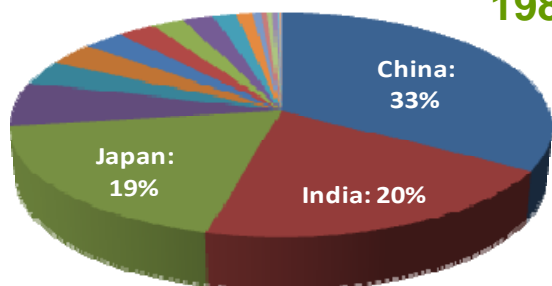


- At regional level, imports and exports present <15% of material consumption.
- Large variations between resource-endowed, exporting countries and resource-constrained, importing countries.

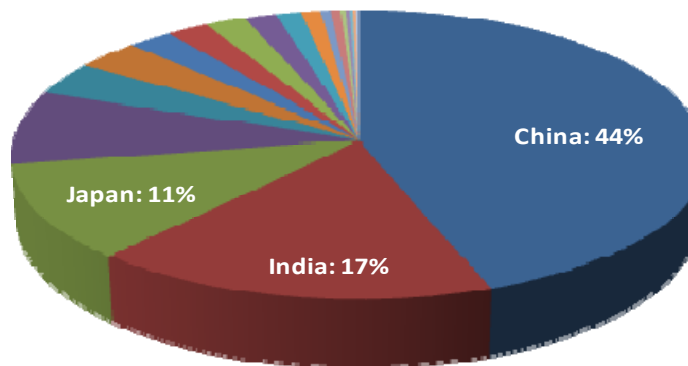


Absolute Material Consumption

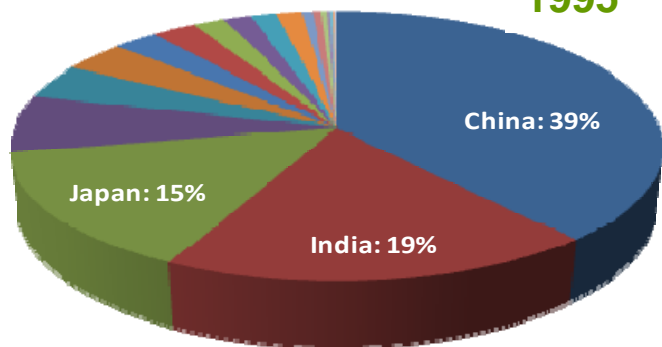
1985



2005

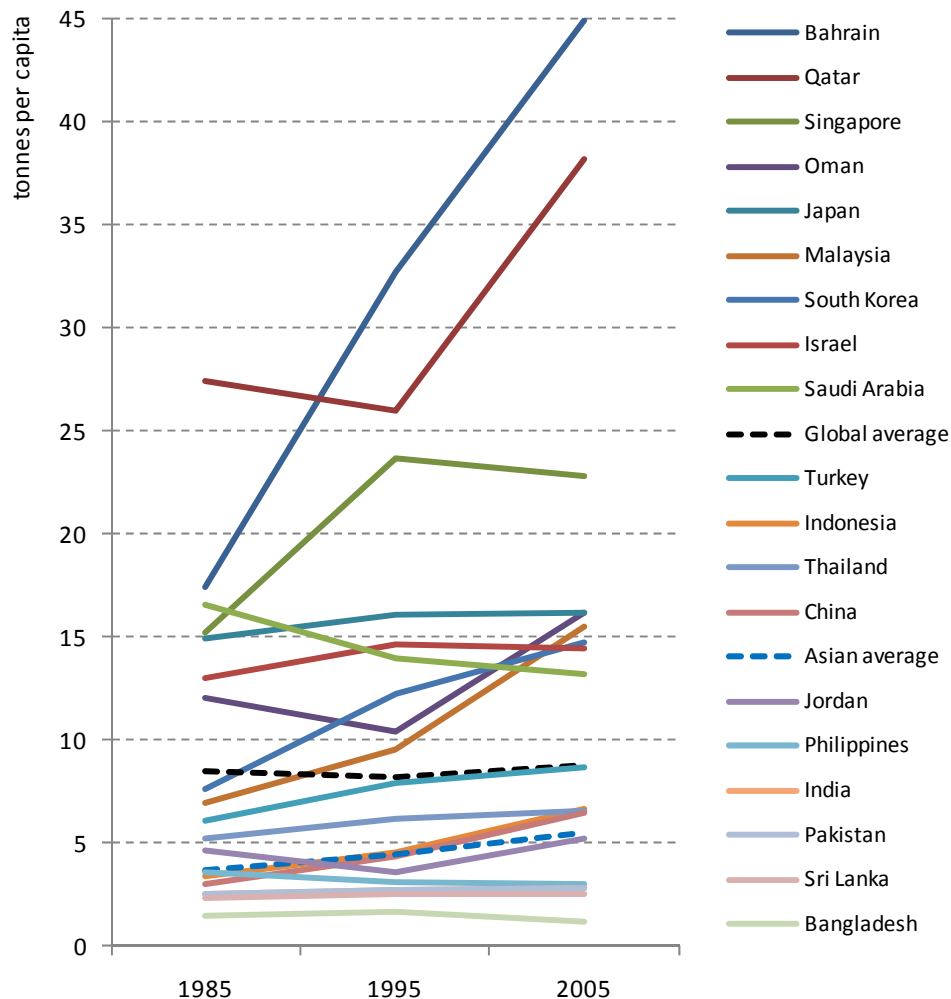


1995



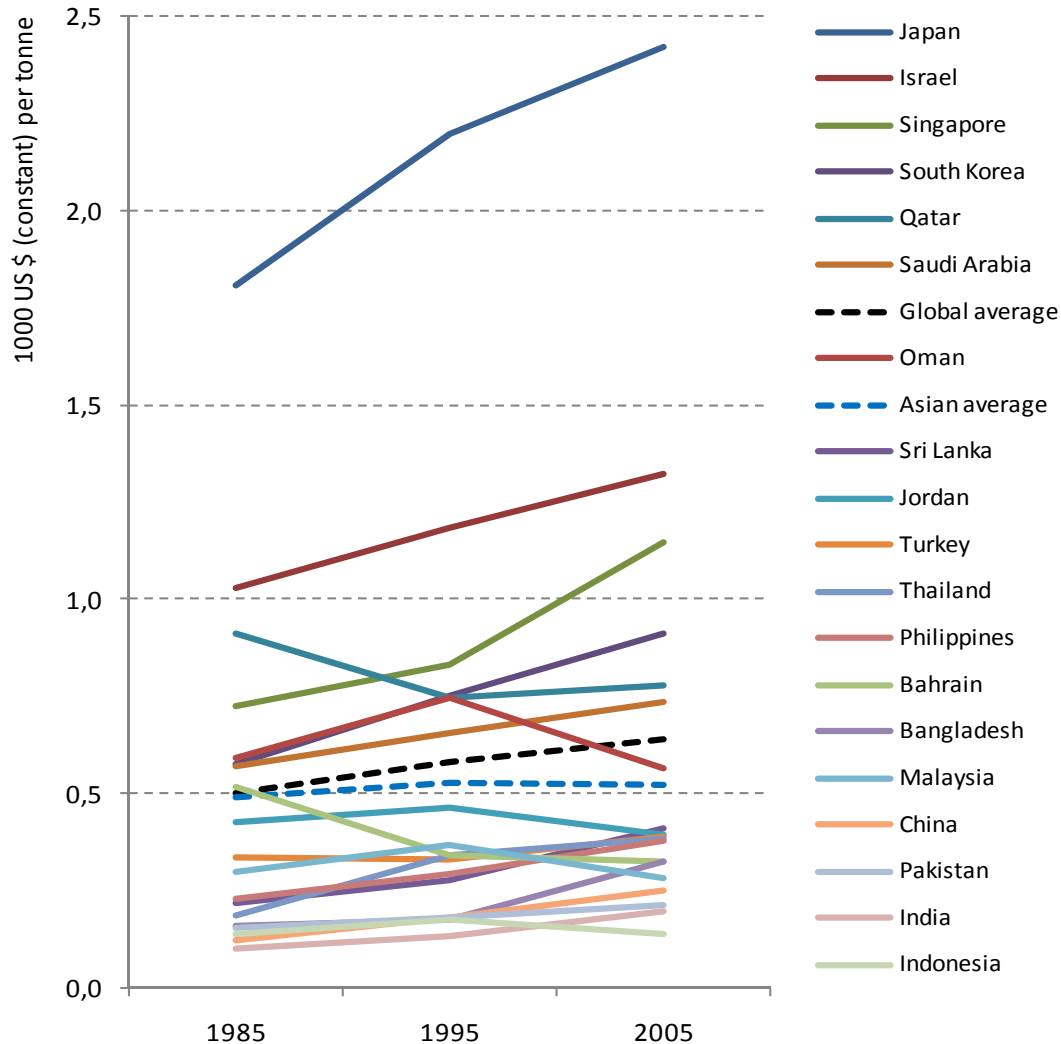
- China
- India
- Japan
- Indonesia
- South Korea
- Turkey
- Pakistan
- Thailand
- Malaysia
- Saudi Arabia
- Philippines
- Bangladesh
- Singapore
- Israel
- Sri Lanka
- Oman
- Bahrain
- Qatar
- Jordan

Material Consumption Per Capita



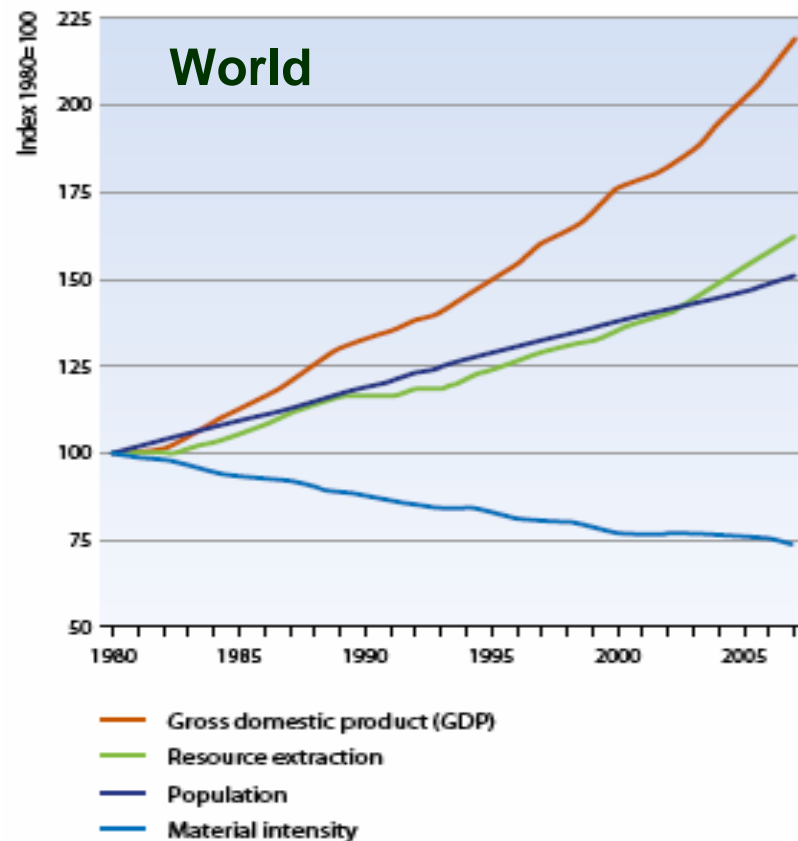
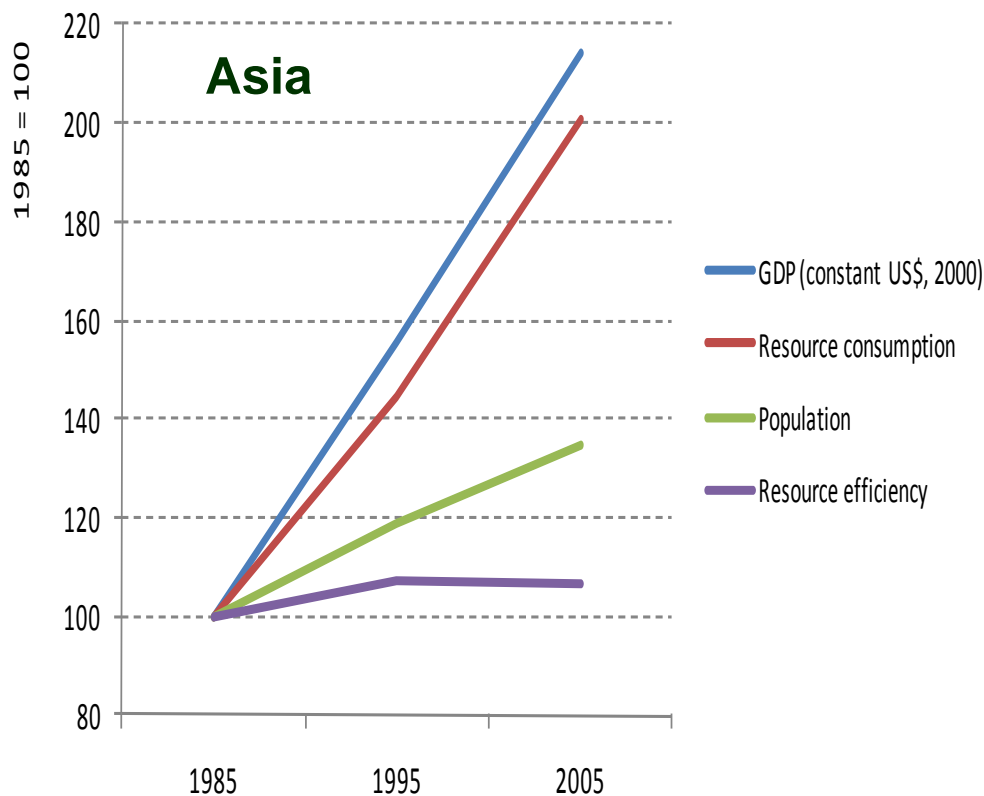
- Average increased from 3.7 to 5.5 tonnes/capita, compared to global average of 8.5 tonnes/capita.
- Low and near constant or even declining in lowest income countries (India, Pakistan, Bangladesh, Sri Lanka, Philippines).
- China and Indonesia more than doubled, from 3 to 6.5 tonnes/capita.
- Small, rich countries had high consumption and grew fast (Bahrain, Qatar, Oman and Singapore).

Material Productivity



- Average improved slightly, from \$490 to \$520/tonne, compared to global average of \$640/tonne
- Biggest emerging economies are among the least resource efficient (China, India)
- Growth in extractive sectors decreased materials productivity (Malaysia, Indonesia)
- Lowest income countries have higher materials efficiency than some emerging economies (e.g. Bangladesh, compared to China, India and Indonesia)

Relative Decoupling Trends



- In Asia, GDP grew by 144%, materials consumption by 101%, population by 35%
- Early signs of decoupling have not been sustained since 2005
- Global trend of ~25% relative decoupling since 1990 is not replicated in Asia



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Industry and Cities



Eco-Cities

- In most economies, the construction/housing, food, and transport sectors account for nearly 70% of material, energy, and land use. Much of these sectors' activities is in cities.
- Eco-cities: areas where urban planning and environmental management tools are applied to pursue synergies in resource utilization and productivity, waste management, environmental preservation, industrial and economic development and a healthy living environment.

UNIDO, in cooperation with the government of Jordan, established the Eco-Cities of the Mediterranean Forum which had its second main conference on 11-12 October 2011 in Marseille, France

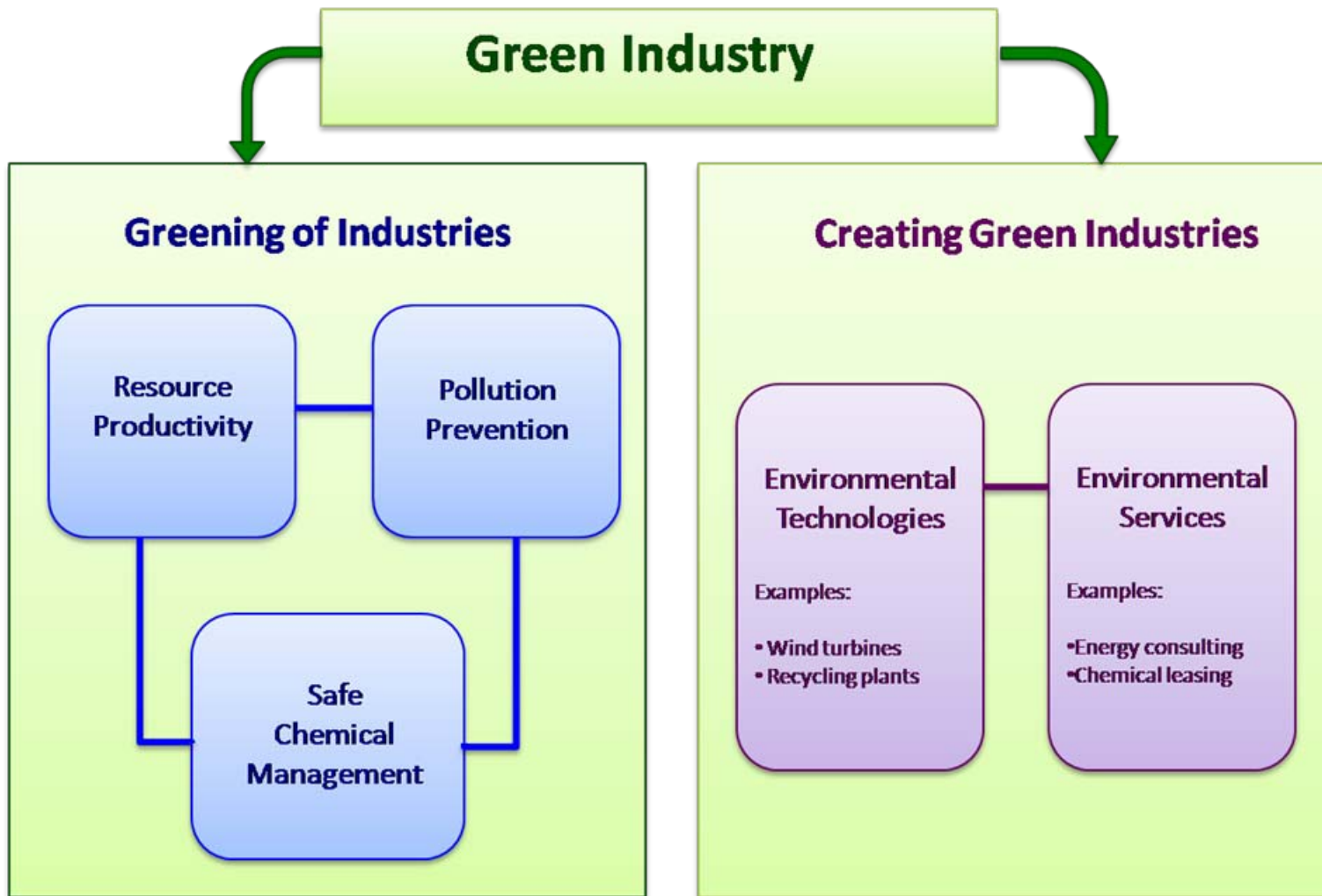


Industries in Eco-Cities

- Industries are mostly located in urban (municipal) settings
- Industries being more resource efficient, less polluting will be an important part of eco-cities
- Industries can also provide the environmental services needed by eco-cities



“Green Industry”: A Definition





1st Strategy: Greening Industry

- Ensuring that all industries, regardless of sector, size or location, continuously improve their resource productivity and decrease environmental burdens
- Aim is to reduce the environmental impacts of processes and products by:
 - using resources more efficiently;
 - phasing out toxic substances;
 - substituting fossil fuels with renewable energy sources;
 - taking increased producer responsibility;
 - reducing the overall risks.



2nd Strategy: Creating Green Industries

- Stimulating the development and creation of industries that provide environmental goods and services
- Covers all types of services and technologies aimed at contributing to reducing negative environmental impacts. This includes:
 - materials recovery;
 - recycling companies;
 - waste management;
 - wastewater treatment;
 - air pollution control;
 - renewable energy equipment;
 - energy conservation ...



Greening Industries in Cities

■ Enterprise-level

- Improved resource productivity and reduced pollution intensity through intra-firm measures

Resource productivity

→ *Efficiency*

■ Industry-sector level

- Resource exchanges and collaboration of multiple firms to improve overall resource efficiency and environmental performance

Resource synergy

→ *Symbiosis*



Industrial Symbiosis

- Engages traditionally separate industries in a collective approach to competitive advantage involving physical exchange of materials, energy, water, and/or by-products
- The keys to industrial symbiosis are:
 - Collaboration; and
 - Synergistic possibilities offered by geographic proximity.



Creating Green Industries in Cities

- **Solid and Hazardous Waste:** Waste collection, recycling, treatment, disposal, (clean-up)
- **Water:** Water purification, wastewater treatment
- **Air:** Air pollutant treatment
- **Renewable Energy:** Decentralized RE technologies, smart grids
- **Energy Efficiency:** Building energy conservation, transportation optimization
- The 3Rs concept applies to all stages of the production-consumption cycle: design, manufacture, by-products and waste minimization in manufacturing; purchasing, use, and disposal on the consumer side.



Examples of 3R Green Businesses

REDUCE	REUSE	RECYCLE
<p>Biotechnology</p> <p>Information technology for eco-labeling</p> <p>Eco-efficient transport/electric cars</p> <p>Car-share technologies</p> <p>Renewable energy</p> <p>Household water saving devices</p>	<p>Information technology – eBay, PayPal</p> <p>Exchangeable/reusable parts</p> <p>Multi-purpose design</p> <p>Antiques/Thrift Stores</p> <p>Containers (e.g. glass bottles)</p> <p>Used cars, cell phones etc.</p>	<p>Composting</p> <p>Urban mining</p> <p>Recycled building materials</p> <p>Waste recycling systems</p> <p>Eco-design</p> <p>E-waste recycling of rare minerals</p> <p>Waste to energy</p> <p>Household appliances</p> <p>Paper and cardboard recycling</p>



Integrating Industry and the City

Industrial
Symbiosis

Urban
Symbiosis

Eco-Cities

Use of byproducts from cities in industrial operations
Exploitation of synergistic opportunities arising from the geographic proximity of urban waste sources and potential industrial users through the transfer of wastes for environmental and economic benefit.



The Way Forward - 1

National Governments

- Mainstream 3Rs into national development agenda, incl. environmental, social, and economic plans, policies, strategies and programmes;
- Through appropriate legislation, establish long-term recycling targets; these provide certainty of supply of recyclables and guarantee willingness to pay;
- Developing countries to mobilize additional financial resources with bilateral and multilateral donors for 3R implementation, incl. transfer of modern technologies and associated capacity strengthening.



The Way Forward - 2

National & Local Governments

- Build adequate technical and human resource capacity for collection and safe treatment of toxic and hazardous wastes, incl. house-hold waste, medical waste, and e-waste;
- Use 3R technologies/practices to create new, entrepreneurial businesses;
- Create waste exchanges/matchmaking services – can be at national, regional, local scale;
- Use procurement power to influence demand (“green procurement”)



The Way Forward - 3

Local Governments

- Use existing powers to drive/guide 3Rs and greenness:
 - ✓ Through land-use powers (e.g., siting of industries);
 - ✓ Through proper enforcement of discharge and emissions limits (and perhaps also setting of the limits);
 - ✓ Through how key services like water supply, WWT, waste disposal are supplied;
 - ✓ Through how they manage public buildings.
- Develop eco-industrial zones and clusters to strengthen industrial capacity for recycling and for industrial symbiosis.



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THANK YOU!