



# Greening Small and Medium Enterprises

pathway to natural resource efficiency and low carbon development



**René VAN BERKEL**  
UNIDO Representative  
UNIDO Regional Office in India

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# Low Carbon Development

- Development that contributes to mitigation of – and adaptation to – climate change through application of low-emission development strategies
  - Forward-looking national economic development plans or strategies that encompass low-emission and/or climate-resilient economic growth
- It takes a "development-first" approach which rethinks development planning and proposes structural solutions (such as alternative infrastructure and spatial planning) with lower emission trajectories.
- It focuses on addressing and integrating climate change with development objectives and is therefore a more useful approach for developing countries. In practice, the plans are often combinations of new and existing elements, all combined in a new way to address pre-existing policy objectives along with the need to slow climate change and prepare for its impacts.





## Low C Industrial Energy Agenda

### • Industrial Energy Efficiency

1. Cross sector approaches
  - EnMS, ISO50001
2. Energy Services Systems
  - Steam, cooling, lighting, compressed air, etc.
3. Universal equipment and machinery
  - Motors, pumps, boilers, etc.
4. Technology/Sector Innovations
  - New technologies, process intensification and integration

### • Renewable Energy for Productive Uses

- Bio-energy, including from waste and waste water
- Solar heating, cooling, lighting
- Small scale wind, hydro, PV, geo


# Low Carbon Industrial Development

## Industrial Resource Efficiency delivering low carbon industrial development


**DEMATERIALIZING PRODUCTS**  
developing new products that require less materials and energy over their lifecycle



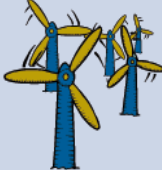
**INCREASING PROCESS EFFICIENCY**  
reducing the intensity of use of energy, materials chemicals and water



**MINIMIZING PROCESS EMISSIONS**  
adopting clean technologies to minimize the generation of non-energy greenhouse gases



**SWITCHING TO LOW-CARBON INPUTS**  
using renewable and other low-carbon sources of energy and materials



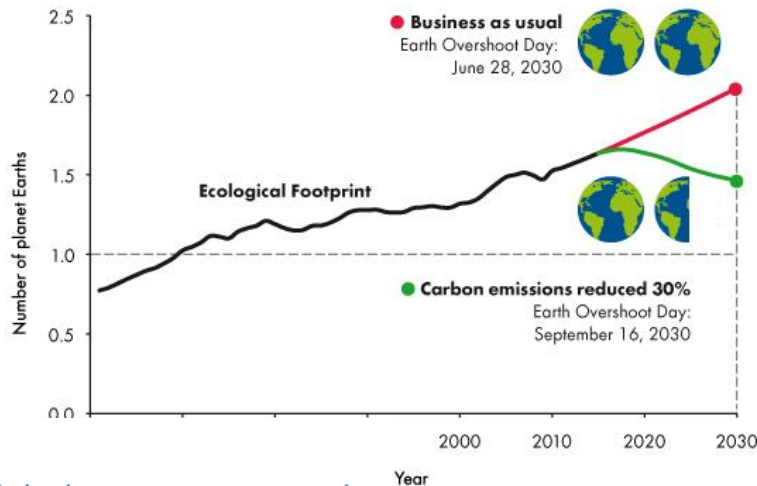
**CLOSING THE CARBON LOOP**  
recovering organic wastes for reuse as feedstock for energy and materials



# Resource Efficiency

- **Resource efficiency** means using the Earth's limited resources in a sustainable manner while minimising impacts on the environment. It allows us to create more with less and to deliver greater value with less input (EU).

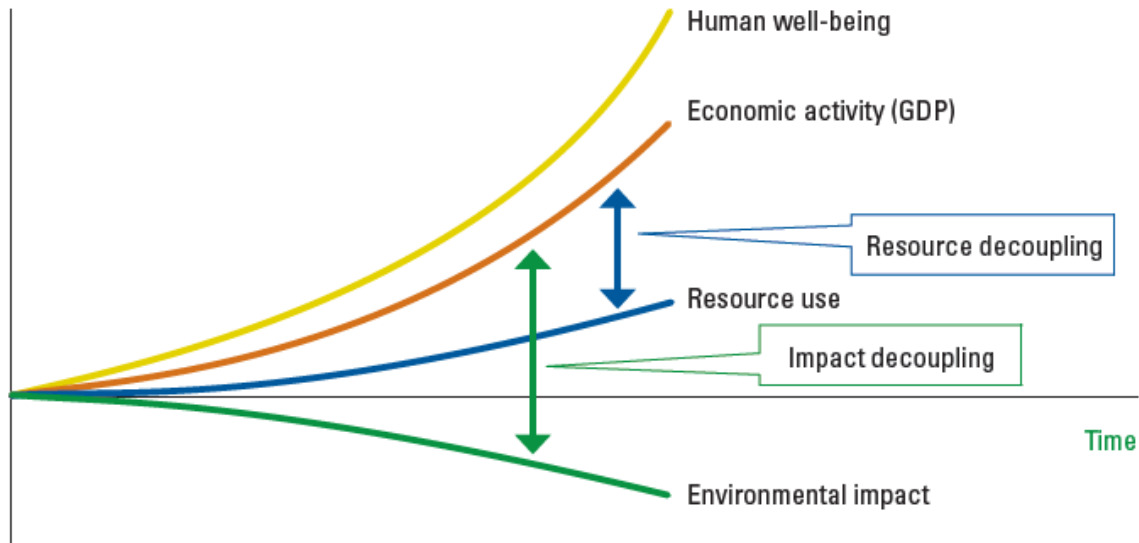
How many Earths does it take to support humanity?



Country	Ecological Footprint (gha/person) [2013]	Biocapacity (gha/person) [2013]
Afghanistan	0.89	0.48
Bangladesh	0.75	0.37
Bhutan	4.61	5.14
India	1.06	0.44
Nepal	0.93	0.54
Pakistan	0.75	0.35
Sri Lanka	1.43	0.48
South Asia	1.09	0.44
Asia	2.32	0.77
World	2.87	1.71



# Doing *More With Less* for *More*



*Decoupling economic development from increased natural resource consumption and aggravated negative environmental impacts*





# Materiality to Small and Medium Enterprises

- Resource Dependency
  - Production is dependent on use of natural resources as input materials, including auxiliaries and chemicals, water and energy
  - Discharge of waste and pollution poses a threat to quality and availability of such needed natural resources
- Environmental Requirements
  - Legal standards define minimum, yet their effectiveness is undermined when enforcement lacks human, technical, administrative and legal resources and lacks transparency and predictability
  - Market and stakeholders' expectations go beyond legal requirements
- Environmental Costs and Liabilities to Business, particularly SMEs
  - Total costs of wastes are typically undervalued and hidden in overheads
  - Risks and liabilities neither understood nor managed



## Performance Areas





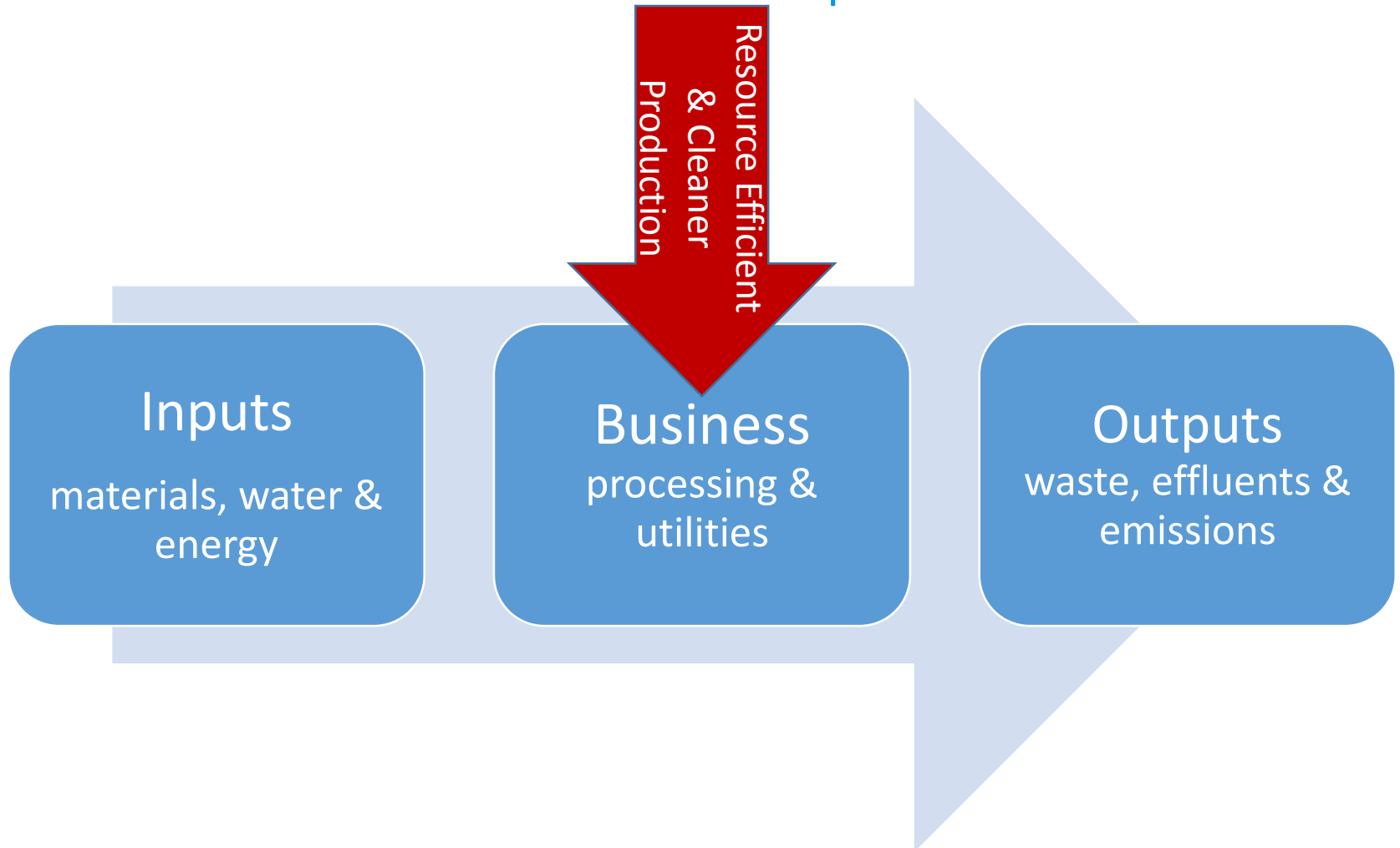


# Performance Areas

- Resource Efficiency
  - Minimize the use of (natural) resources by businesses, including particularly the efficient use of materials, chemicals, water and energy
- Environmental Stewardship
  - Conserve the environment, in particular through reduction of environmental impacts of resource use (water, land, renewables etc.) and environmentally sound treatment and discharge of waste and pollutants
- Risk Reduction
  - Minimize hazards to people and environment, through substitution of hazardous substances, operating and process conditions, technologies etc.
- Emergency Preparedness
  - Ability to limit disruption and damage to people, environment, goods and infrastructure in case of accident



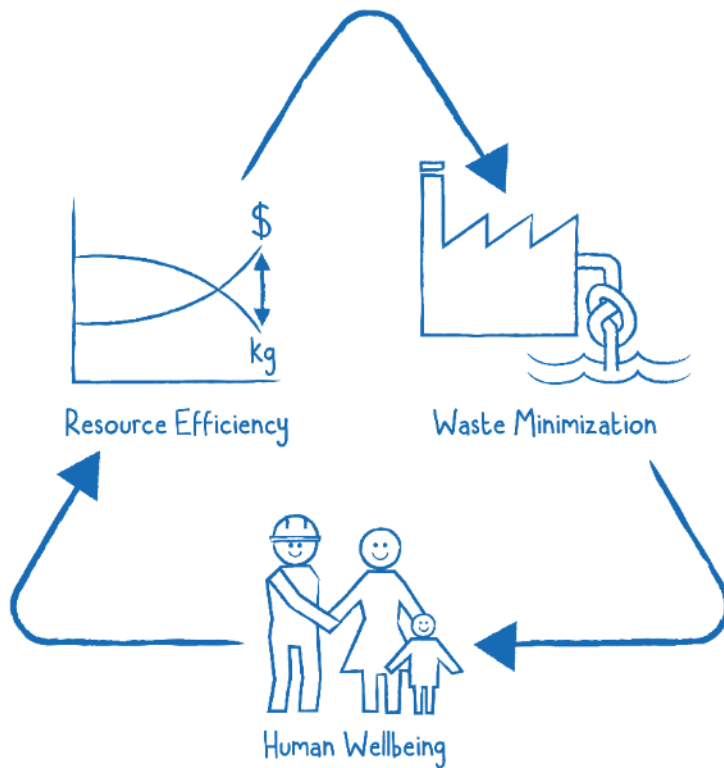
# Intervention Options



# Resource Efficient and Cleaner Production

- Finding and implementing ways to

- Improve productive use of materials, water and energy
  - Thereby
- Reduce the generation of waste, effluent and emission
  - Thereby
- Improve well being of employees, consumers and community



**→ Virtuous cycle**

Thereby

- Improve resource efficiency
- Minimize waste
- Improve human wellbeing

# Rathkerewwa Desiccated Coconut Industry

Principal Options Implemented	Benefits			
	Economic		Resource Use	Pollution generated
	Investment [USD]	Cost Saving [USD/yr]	Reductions in energy use, water use and/or materials use (per annum)	Reductions in waste water, air emissions and/or waste generation (per annum)
Reduction of coconut kernel during peeling	< USD 100	USD 94,500	Waste of coconut kernel reduced by 50% (30 kg per 1000 nuts) and increase in DC output.	Waste generation reduced by 18 tons.
Reduction of water consumption through improved processes and cleaning	< USD 500	USD 6,600	Reduced water consumption by 5,400 kl.	Waste water volume was reduced by 50%.
Recovery of oil from coconut water in wastewater pits	USD 2,200	USD 49,500	Recovered oil which has economic value.	Reduced BOD and oil in waste water.
Switching fuel from fossil fuel to coconut shells	USD 1,450	USD 165,000	Reduced use of fossil fuels and utilization of wasted coconut shell pieces from the DC process.	Reduced GHG emissions by almost 900 tons of CO <sub>2</sub> equivalent.



National Cleaner Production Centre, Sri Lanka

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தேசிய தூய்மை உற்பத்தி நிலையம், இலங்கை

## RECP in Textile Sector (Gujarat)

Number of pilot industries	6
Electrical energy savings (kWhr/yr)	349,303
Fuel savings – coal (tons/yr)	2,027
Fuel savings - agro-waste (tons/yr)	900
Process water savings (m3/yr)	193,976
Reduction in chemical usage – caustic (tons/yr)	770
Monetary savings (Rs/yr)	42,260,500



1. Reuse of condensate and cooling water as boiler feed water
2. Reuse of treated effluent for screen washing
3. Water use optimization – jiggers
4. Caustic soda recovery system
5. Caustic batch washing instead of continuous wash
6. Replace caustic scouring with enzymatic scouring
7. Reuse of alkaline for mercerizing
8. Efficient boiler operation
9. Heat optimization jigger machines
10. Low liquor jet dyeing machines
11. Automatic colour matching and preparation
12. Variable Frequency Drive on jet dyeing machines
13. Flash steam recovery from dryer range for boiler water preheating
14. Heat loss reduction in cylinder dryer ranges
15. Optimization of dryers with exhaust humidity controllers

Gujarat Cleaner Production Centre, 2015

# Greening Thai Automotive Supply Chain

- 74 SMEs achieved
  - Annual monetary savings of 7.9M EUR
  - Waste reduced by 2,161 ton/yr, average of 49%
  - Waste water reduced by 118,230 m<sup>3</sup>/yr, average of 51%
  - Energy reduced by 27%, contributing to 16,431 ton reduction of GHG emissions
  - Improved rankings in GreenMark Certification
  - Improved access to financing



# Business Case



## Status Quo

- RECP proven as a *ReCiPE* for sustainable business
  - Promotion of business cases has not yet resulted in significant upscaling



- Barriers
  - *Not worth our effort*
  - Benefits and perceived need are not great enough
    - Resource prices, rule of law, environmental policy, markets, responsibility
  - *Too complicated for us*
  - Implementation effort too high
    - Accessibility, appropriateness and affordability of RECP services, solutions and finance



# Enterprise Barriers

Getting Started



Lacking interest & understanding, denial of responsibility

Developing & Assessing Opportunities



Lacking data, obsolete technology, organizational inertia

Implementing Solutions



Lacking technical, management & financial resources



*Not Worth Our Effort*

## Demand Creation

Increasing awareness for and understanding of the importance of environmental management and resource conservation and developing the business case

*Too Complicated for Us*

## Market Transformation

Reducing costs and risks through standardization of replicable technologies accompanied by tailored financial instrument



# Resource Efficient and Cleaner Production

RECP = RECiPe

- A recipe for profitable, sustainable and responsible Small and Medium Enterprises



## René VAN BERKEL

United Nations Industrial Development Organization  
r.vanberkel(at)unido.org

