



UNITED NATIONS  
INDUSTRIAL DEVELOPMENT ORGANIZATION



**FIRST REGIONAL CONFERENCE ON  
SUSTAINABLE INDUSTRIAL DEVELOPMENT**  
PROMOTING SUSTAINABLE ENERGY SOLUTIONS  
AND CLEAN TECHNOLOGIES IN CIS COUNTRIES

# Adoption of resource efficient and cleaner production processes



**Dr Branko Dunjić**

**RECP Net**

Executive Committee President

Regional Executive for the Eastern Europe, Caucasus and  
Central Asia Regional Chapter

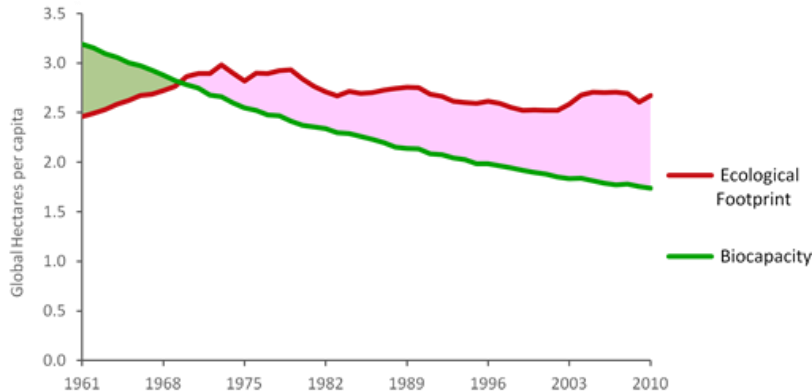
Director

Cleaner Production Centre of Serbia

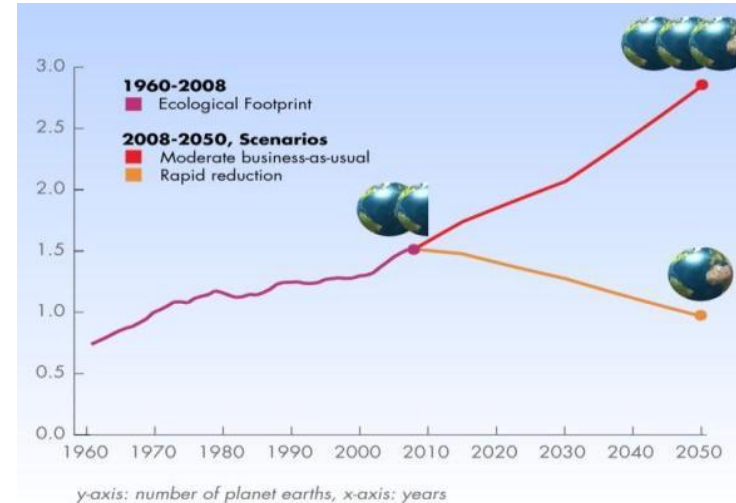
**RECP***net*

# Global Overshoot

## World

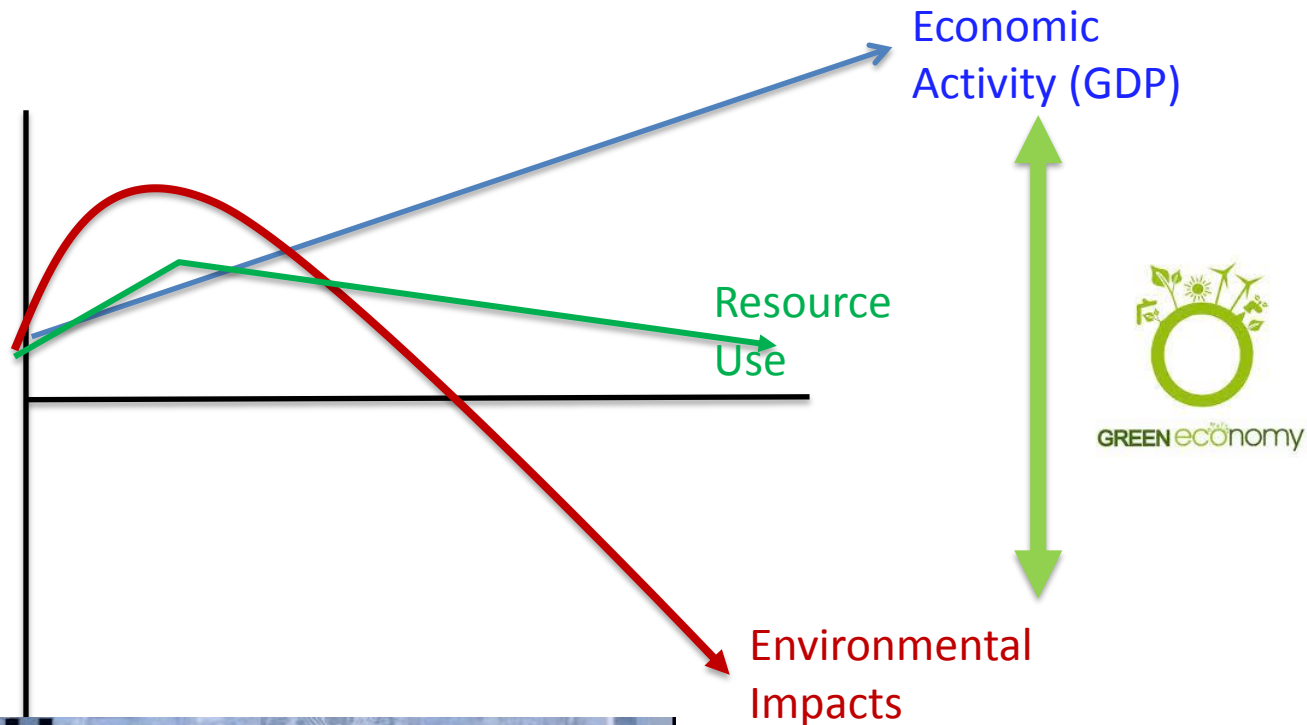


Since 1987 in overshoot,  
currently global footprint  
exceeds bio-available capacity  
by approximately 50%



By 2050 in moderate scenario  
3 planets Earth will be needed

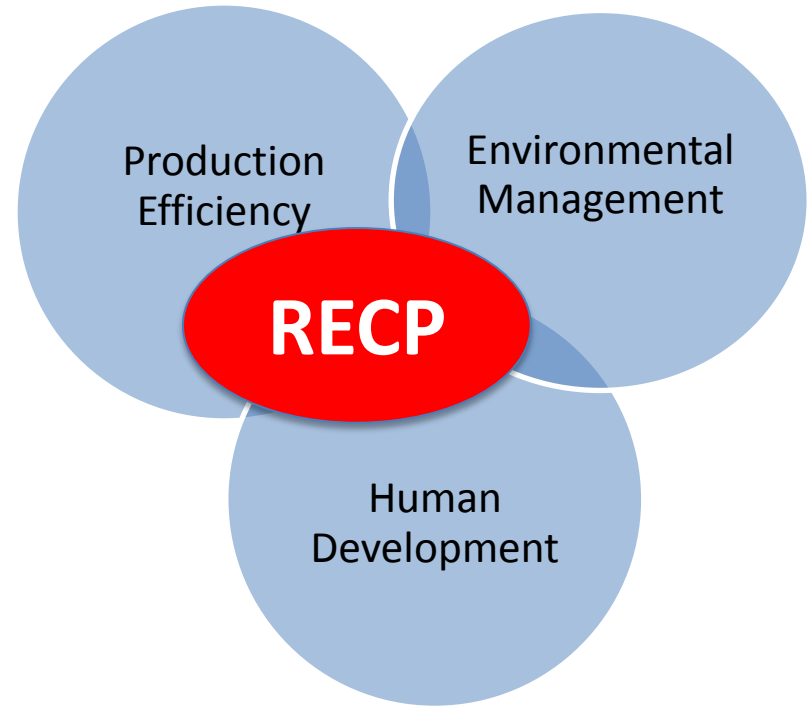
Source: [www.footprintnetwork.org](http://www.footprintnetwork.org) last accessed 8<sup>th</sup> February 2015



**Decoupling** natural resource  
use and environmental impacts  
from economic growth

# Resource Efficient and Cleaner Production (RECP)

- Applies preventive environmental techniques and total productivity management practices to increase resource productivity and environmental performance of processes, products and services





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## RECP *Techniques*

Good  
House-  
keeping

Input  
Material  
Change

Better  
Process  
Control

Equipment  
Modifi-  
cation

Resource Efficient & Cleaner Production

Technology  
Change

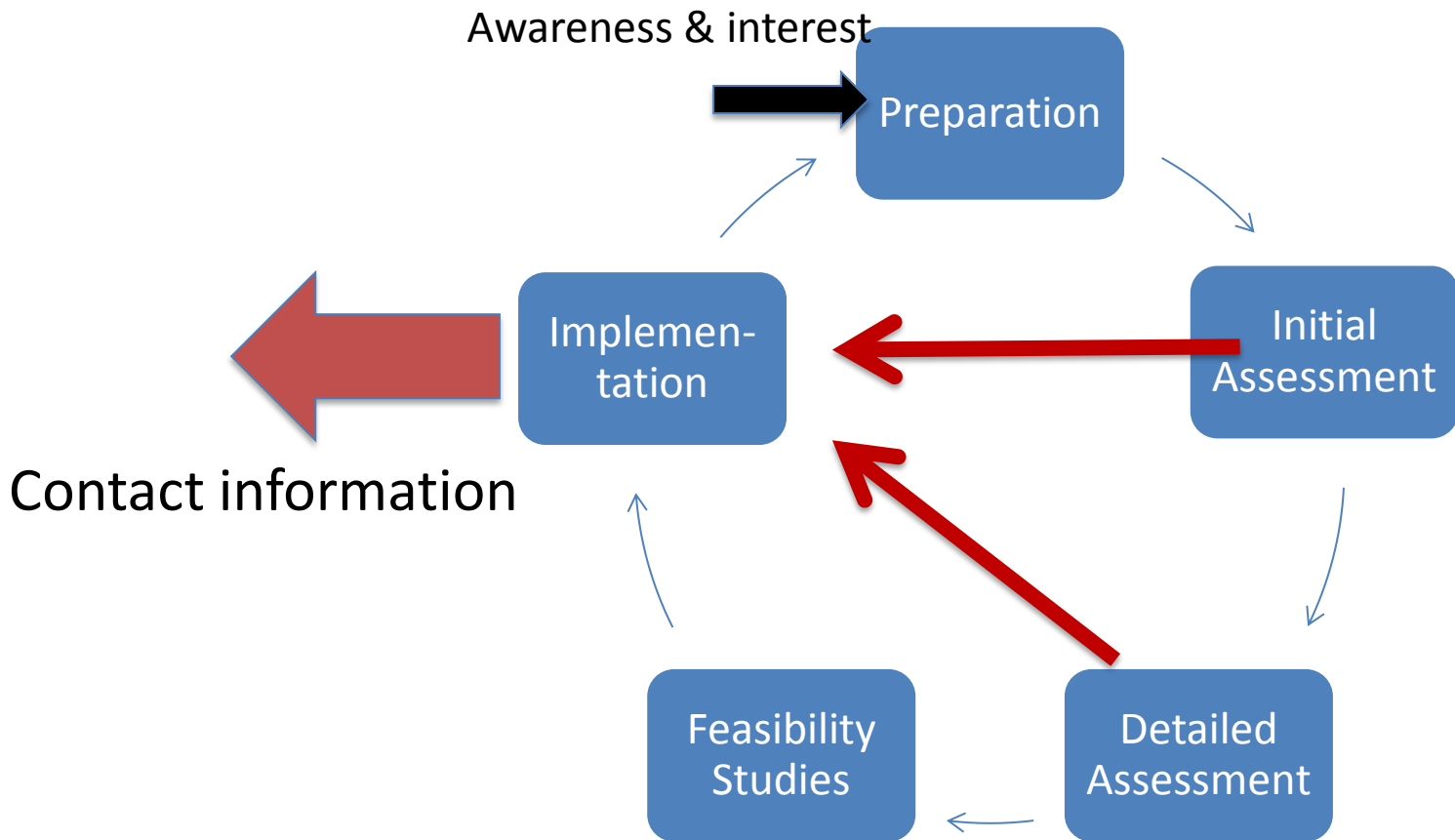
Onsite  
Reuse &  
Recycling

Production  
of Useful  
Byproduct

Product  
Modifi-  
cation



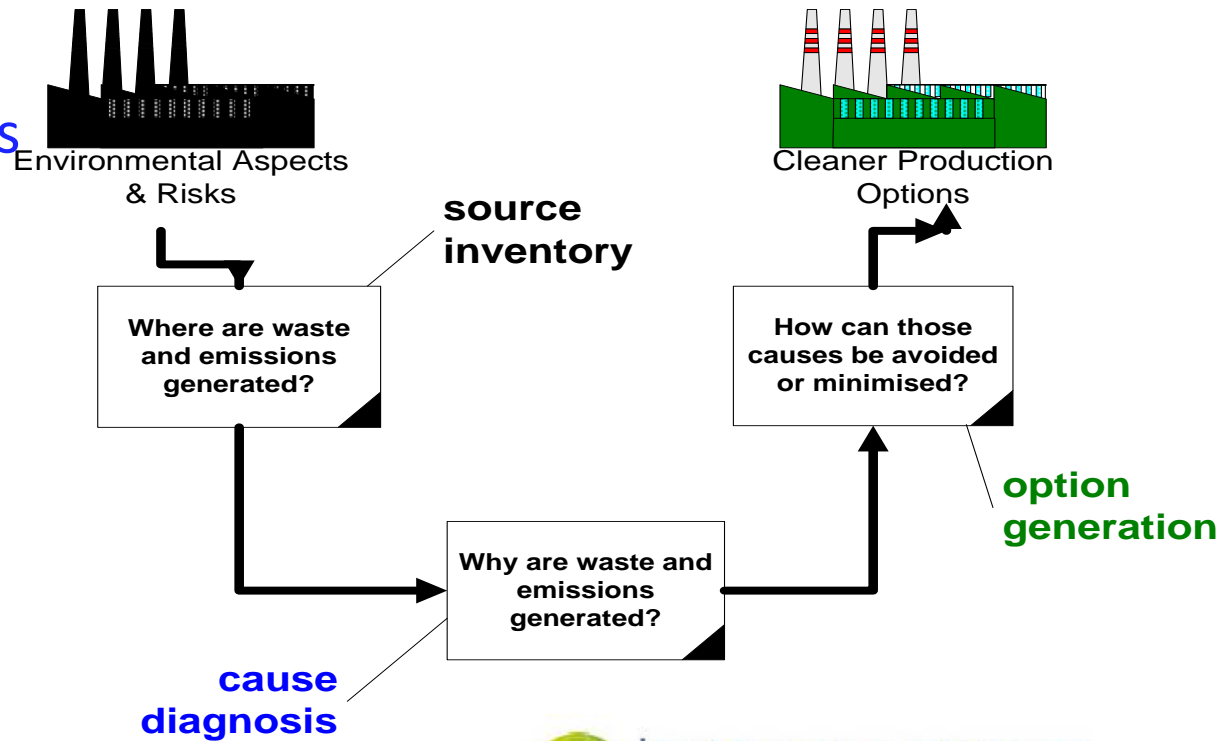
# Assessment Procedure





## RECP Methodology

Systematic root source  
and cause analysis guides  
the identification,  
evaluation and  
implementation of RECP  
opportunities



## RECP in Practice

- 14 RECP options implemented
  - Change of sequence in pickling line and automatic controls
  - Installation of heat recovery unit on boiler
  - Installation of energy efficient motors
  - Use of surface water for cooling purposes
- Total investment: 255,000 EUR
- Pay back <2 yrs
- GHG emission reduction 1,500 ton CO<sub>2</sub>/yr
- 50% water conservation
- 15% natural gas conservation
- 10% electricity conservation







## RECP in Practice

- Options implemented
  - Optimization of the operation of boiler
  - Installation of heat recovery unit on boiler
  - Improved operation and insulation of ovens
  - Reduced air pressure and improved maintenance of compressed air systems
  - Optimization of the cooling circuits
- Total investment: 1.4 M €
- Pay back 3.5 yrs
- GHG emission reduction 2,500 ton CO<sub>2</sub>/yr
- Water conservation: 30,000 m<sup>3</sup>/day





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# RECP in Practice

- In total, seventy-six RECP options were identified and preliminary results (50 % of options evaluated) show that with investment of 164,000,000 € following consumption reductions could be reached:

- Lignite: 330,000 t/year,
- Water for 700,000 m<sup>3</sup>/year,
- Electricity for 20 GWh/year,
- CO<sub>2</sub> emission for 200,000 t/year
- Ash (waste) for 2,000,000 t/year



ЕЛЕКТРОПРИВРЕДА СРБИЈЕ



**Power Producer (Serbia)**



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# Cleaner Production Centre Serbia

Between 2006-2017 100 companies assisted

- Average savings per company: 100,000 EUR/year
- Average decrease of water consumption: 50,000 m<sup>3</sup>/year
- Average decrease in electrical power consumption: 500 MWh/year
- Average decrease in CO<sub>2</sub> emission: 500 t/year





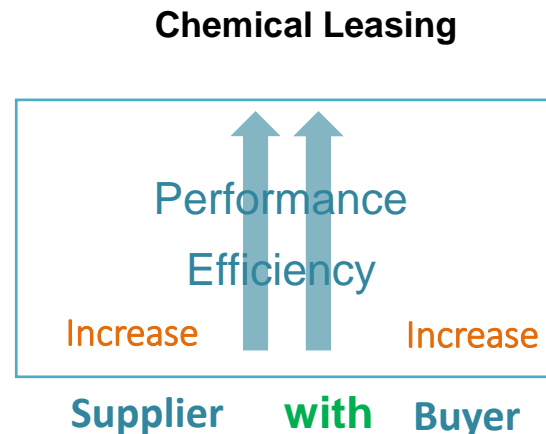
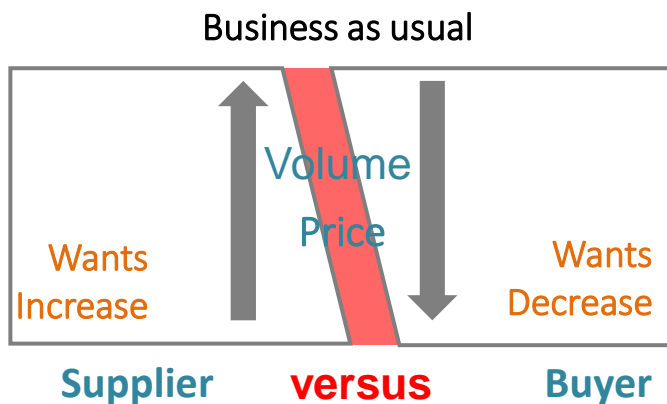
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# Chemical Leasing Essentials

PERFORMANCE-ORIENTED BUSINESS MODEL



Basis for Payment is the performance/service of a Chemicals



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THE BIGGEST PRODUCER OF  
MINERAL WATERS IN SERBIA  
(250.000.000 liters)

**ECOLAB®**

A GLOBAL LEADER IN CLEANING,  
SANITIZING, FOOD SAFETY AND  
INFECTION PREVENTION  
PRODUCTS AND SERVICES

The process:  
Lubrication on the PET bottles  
packaging line

*Unit of payment:*

**Number of working** hours  
of the conveyor **not** kilograms  
of chemicals

- Water is not used for the lubrication process (consumption is reduced for **1500 m<sup>3</sup> year**);
- Sodium hypochlorite is not used for water pretreatment for the line PET 3 (consumption of active chlorine will be reduced for 7.5 kg yearly);
- Consumption of chemicals for waste water treatment will be reduced (can not be quantified as waste water treatment is done by Public Utility);
- The chemical for lubrication with dangerous characteristics is replaced with eco friendly one;
- Consumption of chemicals for lubrication is three times less than before ChL

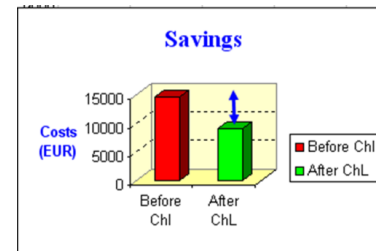


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Before



After



**Chemical  
Leasing**

**ChL in Practice**



# Business Case

- RECP makes generally good business sense
  - Cost savings
    - Materials, energy, water, environmental compliance
  - Productivity enhancements
    - Reduction of non product outputs
  - Improved product quality
    - Better product from better controlled processes
  - Organizational efficiency and effectiveness
    - Staff motivation, business processes
  - License-to-operate
    - Government, community and markets





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# RECP Net



**RECPnet has 65 members in over 60 countries**

- 35 Regular Members
- 23 Observer Members
- 7 Associate Members





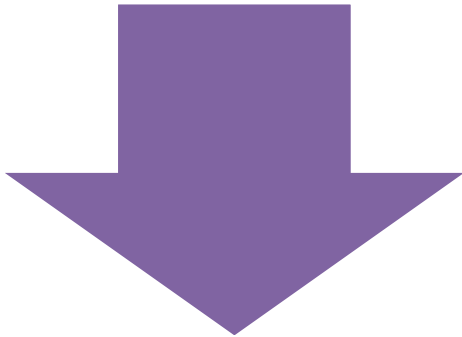
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# RECPnet Vision and Mission

## VISION



“The RECPnet is a globally recognised and valued network of RECP service providers that contributes to sustained, broad and evolving application of RECP in industry and other organisations”



## MISSION

*“Enable members to provide effective and efficient RECP services across the globe; achieve measurable impacts; and advocate RECP benefits to its key stakeholders and society.”*



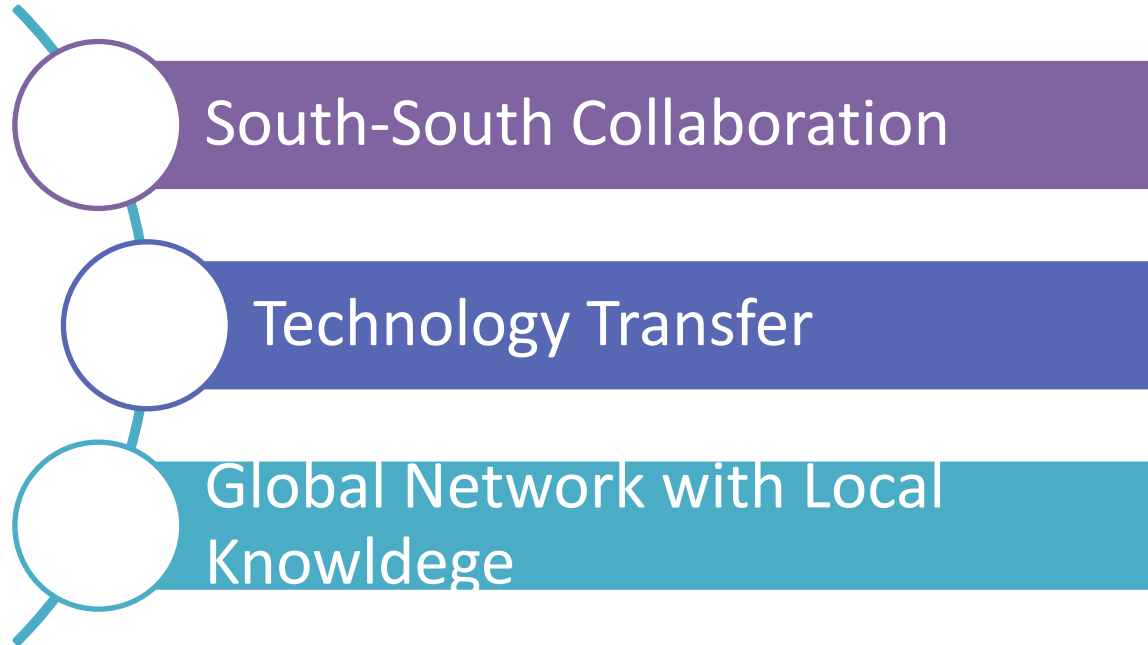


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# Advantages of RECPnet





# RECPnet EECCA Chapter



## 24 Members

- 9 Regular
- 4 Associate
- 11 Observer

<http://www.recpnet.org/members.html>



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# Summary

- RECP
- Applies preventive environmental management concepts and total productivity tools to improve resource productivity, reduce pollution intensity and reduce risks
- Has proven to be beneficial for enterprises, environment, employees, and society and economy at large
- Requires a systematic approach for option identification and integration into management and information systems and operational and maintenance practices
- RECP net is as an important channel for efficient information dissemination and up-scaling of the RECP Programme
- RECP Net is powerful mean to transfer knowledge and technology to the local industry, by local experts.

# Contact information:

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