



EaPGREEN
Partnership for Environment and Growth



TOGETHER
for a sustainable future

1966 - 2016

UNIDO Work in the Areas of Resource Efficient and Cleaner Production and Chemicals

Carolina Gonzalez

Industrial Resource Efficiency Division
Environment Department

UNIDO/UNEP Safe and Responsible Production Seminar
14 July 2016, Minsk



UNITED NATIONS
INDUSTRIAL DEVELOPMENT ORGANIZATION

Inclusive and Sustainable Industrial Development



UNIDO is the specialized agency of the United Nations that promotes **inclusive and sustainable industrial development** for poverty reduction, inclusive globalization and environmental sustainability

Inclusive and Sustainable Industrial Development & the Sustainable Development Goals

- Advancing Economic Competitiveness
- Creating Shared Prosperity
- Safeguarding the Environment



ISID INCLUSIVE AND SUSTAINABLE INDUSTRIAL DEVELOPMENT



Industry in 2030

Goal 9: Build resilient infrastructure, promote sustainable industrialization and foster innovation

- **Raise industry's** share in employment and gross domestic product, by 2030, and **double its share in least developed countries**
- Upgrade infrastructure and retrofit industries to make them sustainable, with **increased resource use efficiency and greater adoption of clean and environmentally sound technologies and industrial processes.**



Green Industry Initiative

Greening of Industries

- Efficient use of materials, energy and water
- Reduction of wastes and emissions
- Safe and responsible management of chemicals
- Phasing out toxic substances
- Substituting fossil fuels with renewable energy sources
- Product and process redesign

Creating New Green Industries

- Reduce, reuse and recycle (3R) industries
- Pollution control technology and equipment
- Renewable and energy-efficient technologies
- Waste management and resource recovery
- Environmental advisory and analytical services

Resource Efficiency & Cleaner Production (RECP) Programme



PRODUCTION EFFICIENCY

Improve productive use of natural resources

ENVIRONMENTAL PROTECTION

Minimize the impact on nature

SOCIAL ENHANCEMENT

Support communities and reduce risks



Increase productivity



Reduce emissions and the use of natural resources



Improve the well-being of workers and communities

Spreading Global Uptake



RECPnet Regional Chapters

- Africa
- Arab Region
- Asia and the Pacific
- Eastern Europe, Caucasus and Central Asia
- Latin America and the Caribbean



74 members

- ▼ Regular
- Associate
- 📍 Observers

Global Network for Resource Efficient and Cleaner Production (RECPnet)

- Centres of expertise working with industry to scale up and mainstream RECP
- Powerful South-South network: knowledge, experience, technology transfer
- Over 70 members in more than 60 countries

EaP GREEN

Greening Economies in Eastern Neighborhood

Donor: European Commission

Countries: Armenia, Azerbaijan, Belarus, Georgia, Moldova & Ukraine

Implementing agencies: OECD, UNECE, UNEP & UNIDO

Duration: 2013 – September 2017 (no-cost extension application)

Budget: EUR 2,480,000

OVERALL OBJECTIVE

Assists six countries of the European Union Eastern Neighborhood Partnership in moving towards a **green economy** framework.

www.eap-green.org

Division of work among Implementing Agencies

OECD:

green growth indicators,
environmental taxation and
subsidy reform, improving access
to finance and greening of SMEs
(Component 1)

UNECE:

strategic environmental
assessment,
environmental impact assessment
(Component 2)

**Coordination and visibility
(OECD and EC)**

UNEP:

strategic planning, sustainable
public procurement, organic
agriculture
(Component 1 and 3)

UNIDO:

resource efficient and cleaner
production in the manufacturing
sector
(Component 3)

UNIDO - Component 3: Regional RECP Demonstration Project

Improve the resource productivity and environmental performance of businesses and other organizations in the

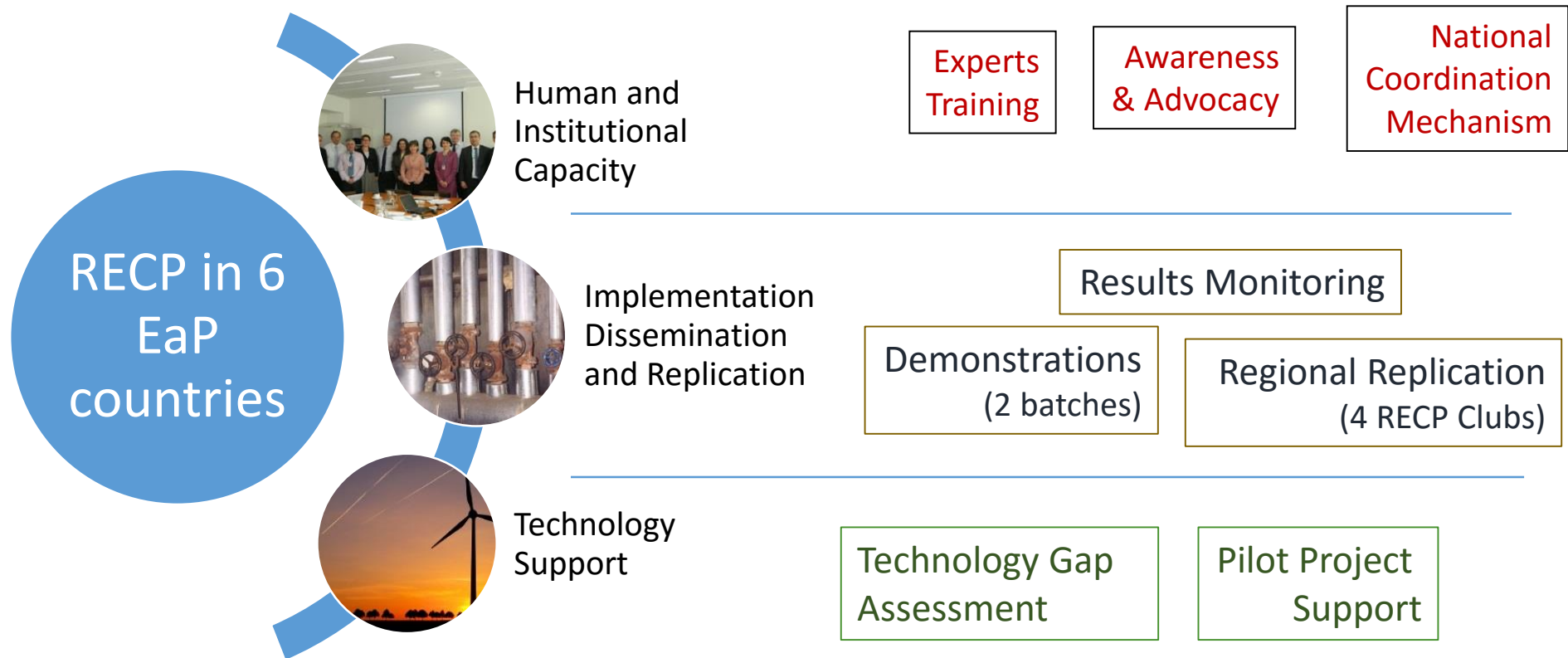
- food,
- chemicals and
- construction materials sectors

and thereby contribute to **sustainable industrial development** and the generation of employment and incomes

*Implemented with additional co-funding from the
Government of Slovenia & the Development Bank of Austria*



UNIDO RECP Demonstration Component



Food processing, chemical and construction materials sectors

RECP Demonstration Component – UNIDO

Selected Publications



РУКОВОДСТВО
по программе ресурсоэффективного и более чистого производства в Республике Беларусь – РЭ/БЧП



Мітек 2015



GHID PENTRU ÎNȚREPRINZĂTORI ȘI ANGAJAȚII LOR

CUM SĂ REDUC CHELTUIELILE ÎMBUNĂȚIND AFACEREA/GOSPODĂRIA ?

CUM SĂ DEVIN PRIETEN AL MEDIULUI ÎNCONJURĂTOR APLICÂND CONCEPTUL NU RISIPI !



Available at National web pages:

www.recip.am

www.recipnet.az

www.recip.by

www.recip.ge

www.ncpp.md

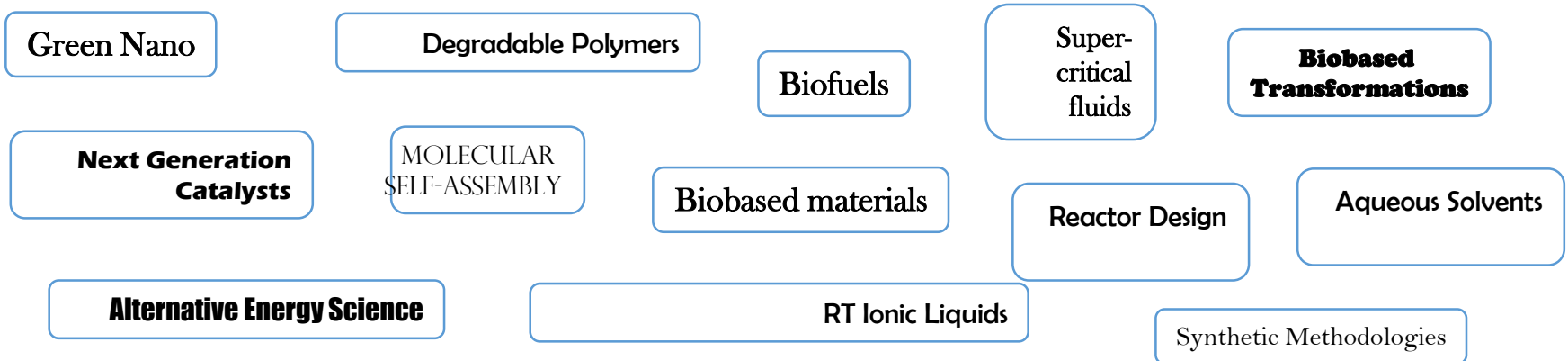
www.recip.kpi.ua/en/projects-en/eap-green

Green and Sustainable Chemistry can be seen as emerging paradigms for putting the Sustainable Development Goals and ISID.

Green Chemistry and Sustainable Chemistry

Green Chemistry is the design of chemical products and processes that reduce or eliminate the use and generation of hazardous substances.

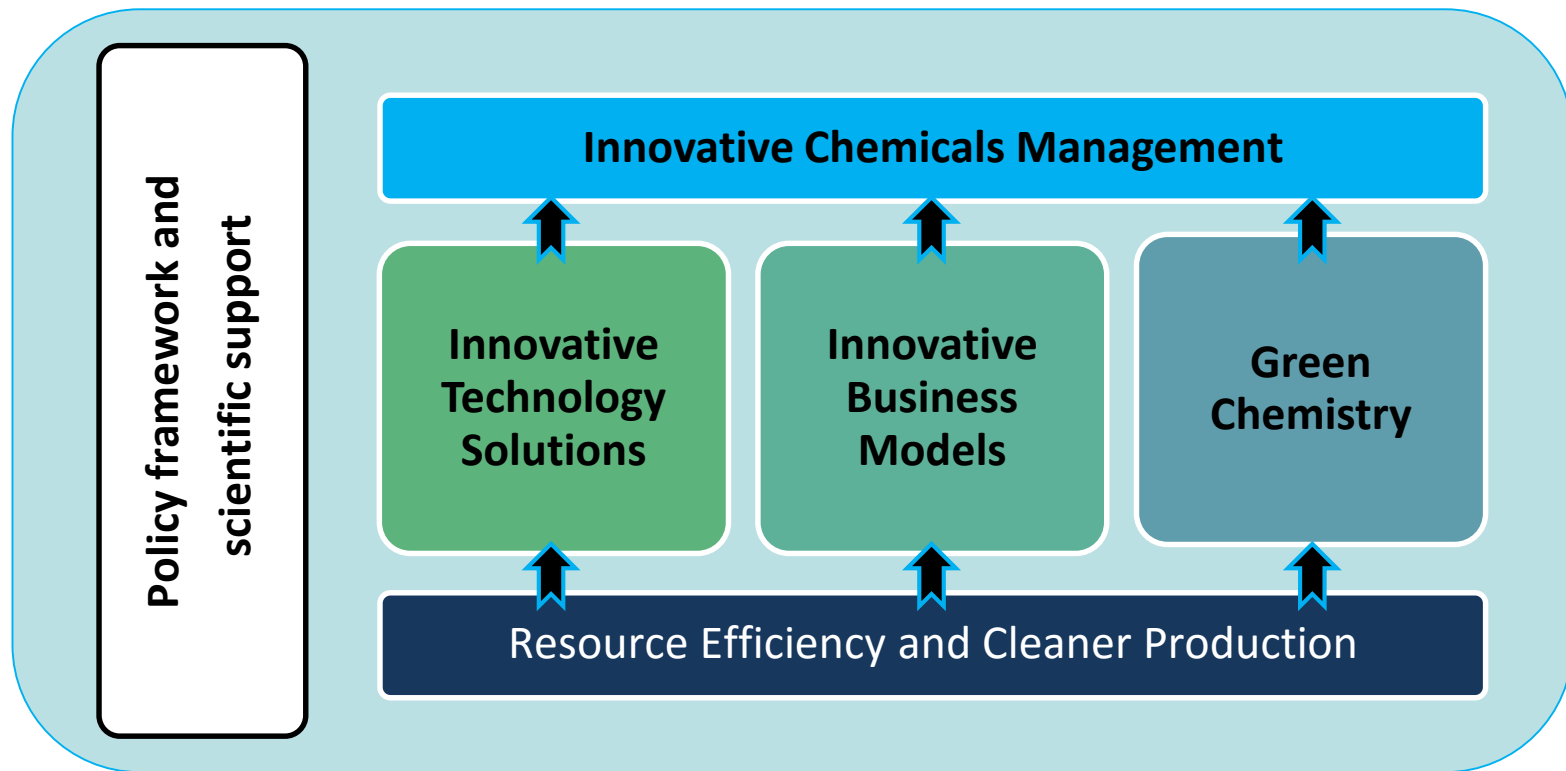
Source: Anastas, Warner (1998)



The concept of sustainable chemistry exists to link preventative protection of the environment and health with an innovative economic strategy that will also result in more jobs.

Source: German Federal Environmental Agency

UNIDO's Innovative Chemicals Management



UNIDO Chemicals Activities

“Implementing science-driven green chemistry and green engineering technologies in various industries of low and middle income countries.”

- Applying the **12 principles of Green Chemistry (Anastas/ Warner, 1998)** to industries by developing business practices based on green chemistry/ engineering technologies
 - **USD 15 million project in the pipeline (submitted to the GEF, under review)**
- Putting emphasis on the **strong link of RECP to sound chemicals management:**
 - Enhancing RECP assessments by measuring the chemical footprint
 - Establishing a global network of NCPC's of Excellence in Green and Sustainable Chemistry
- Advancing green chemistry and sustainable chemistry as **the narrative for implementing international chemicals conventions (Rotterdam, Stockholm, Basel) and SAICM**

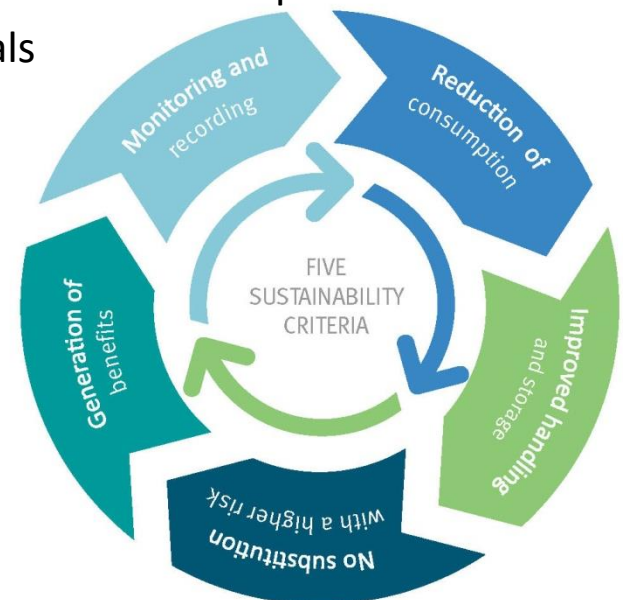
Advancing Circular Business Models

• Chemical Leasing

- UNIDO promotes the model in developing and transition economies
- It is a service-based business model shifting sales focus from volume to performance
- Payment/profit decoupled from consumption of chemicals

• **Impact / Outlook**

- Reduction of resource use, emissions, waste
- Lower risks, health hazards from chemical handling
- Reduced costs, improved competitiveness
- Insulation from global chemical policy shifts
- Better qualification of workers
- Strengthened, longer-term business partnerships

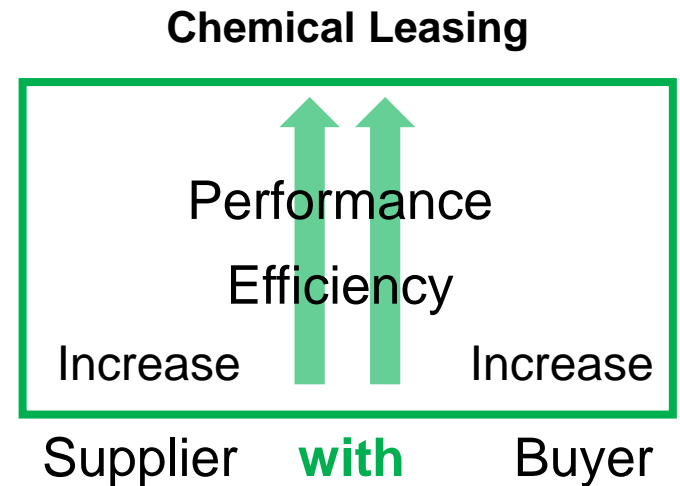
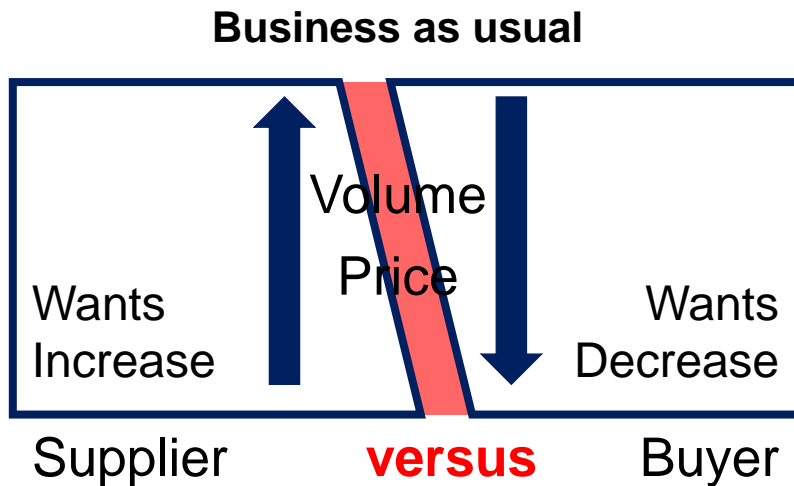


The Chemical Leasing Sustainability Criteria

• **Chemical Leasing - innovative model for green chemistry?**

Chemical Leasing Essentials

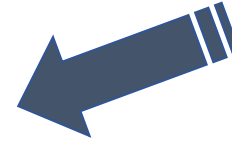
PERFORMANCE-ORIENTED BUSINESS MODEL



Business model & policy instrument for green and sustainable chemistry

Case Study Example

Water Treatment



Chemicals

- Emulsion Breakers
 - Antifoam
- Inverse Breakers
- Water Clarifiers ...

Classical business model: payment per t of chemicals for water treatment

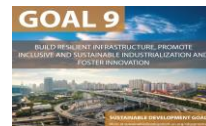
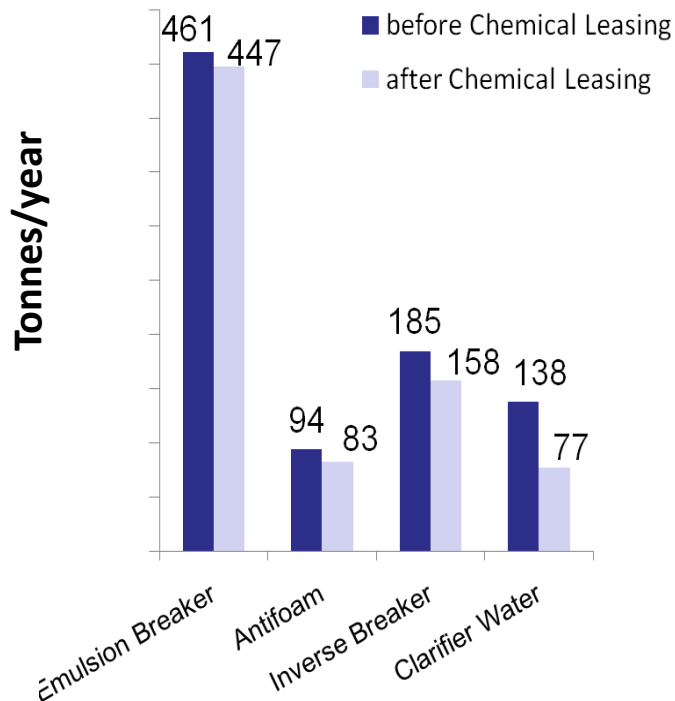
Chemical Leasing: payment per m³ of purified water

Example: Benefits gained

- ✓ **Reduced chemicals consumption of approx. 120 tonnes/year**
- ✓ **Financial savings for Nalco**
 - USD 164,630 (in 2008)
 - USD 249,418 (in 2009)
- ✓ **Financial savings for Ecopetrol**
 - USD 2.500.000 (in 2008-2009)
- ✓ **15 % indirect reduction of energy demand**
(direct energy consumption remains almost equal)



Example: Benefits gained

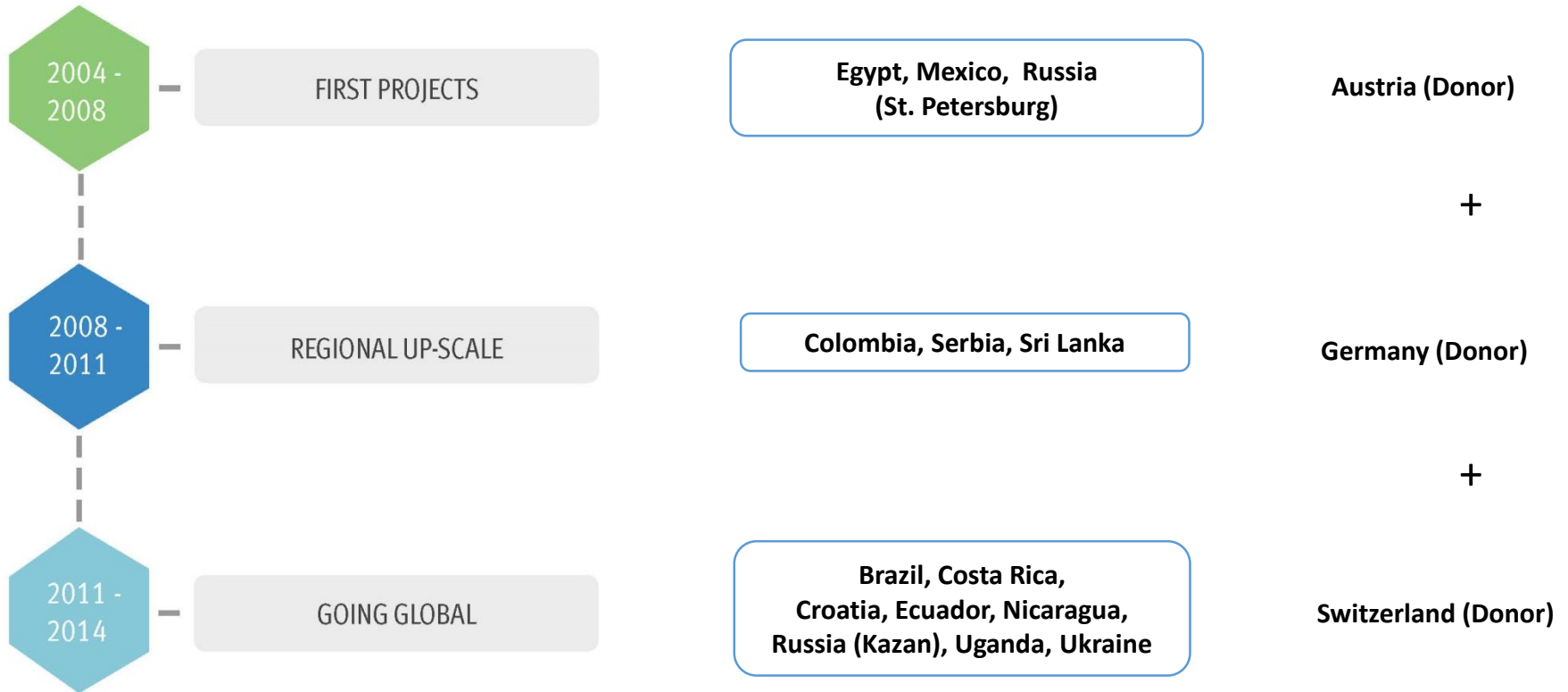


- Economic benefits**
 - ✓ Cost reduction by almost 20 %
 - ✓ Reduction of oil and grease in the cooling towers
- Environmental Benefits**
 - ✓ Removal of 99% of the oil and suspended solids from the waste water
 - ✓ Reduction in polymer consumption
- Social benefits**
 - ✓ Creation of new jobs (laboratories)
 - ✓ Long-term commercial relationship
 - ✓ Better working conditions

Chemical Leasing – applied across sectors

Industry sectors/processes	Chemicals
Manufacture of electronic equipment	Coating powder
Car manufacturing	Hydrocarbon solvents for cleaning
Various industries/steel treatment	Galvanizing and phosphating agents
Beverage production	Lubricants for packaging conveyers; cleaning agents for pipes and vessels
Waste water and drinking water treatment	Water treatment chemicals
Hotel and service sector	Cleaning & disinfectants chemicals
Beverage and food-processing	Glue, solvents, cleaning agents
Petrochemical industry	Catalysts and water treatment chemicals
Agriculture	Pesticides and fertilizers
Printing Industry	Ink, printing chemicals

Up-scaling and Mainstreaming since 2004

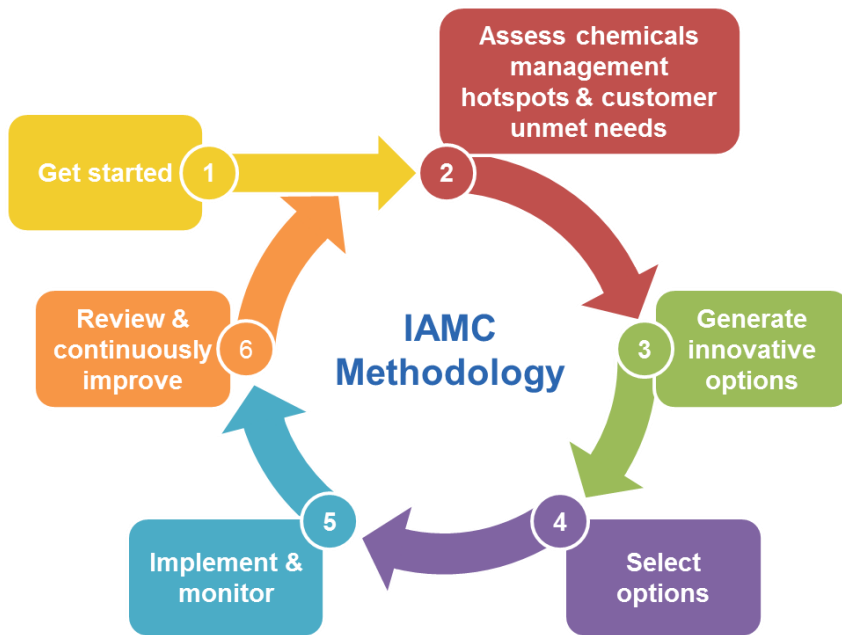


The Chemical Leasing Phases [2004 - 2014]

New strategic approach 2015-2024

Innovative Chemical Solutions

2016: Striving towards excellency in sound chemicals management



IAMC Toolkit and Methodology finalized

- Excellence initiative successfully launched at the second EGM on Innovative Approaches to Sound Management of Chemicals and Chemical Waste (IAMC), held on 11-14 April 2016 in Vienna, Austria
- Four NCPC's selected to become Centre's of Excellence on Sound Chemicals Management
- IAMC toolkit developed for dissemination through IOMC, e-version under development
- 22 RECP assessments with focus in formulation, synthesis and application finalized, 40 assessments on-going, up-scaling to 80+ companies foreseen for 2017 onwards

Outlook & Conclusions

- 1 There is a good momentum for bringing Green and Sustainable Chemistry into the Belarus national policy arena**
- 2 Joining hands with industry is crucial to achieve fast adoption of green chemistry innovations in global economies**
- 3 New ways of doing business will be needed, for example circular economy business models such as Chemical Leasing**
- 4 The role of developing countries will increasingly be important to foster inclusive and sustainable industrial development with green chemistry RECP**
- 5 Initiative of UNIDO is instrumental for wide spread of responsible production approach in Belarus**



Thank You

[c.gonzalez-mueller\(at\)unido.org](mailto:c.gonzalez-mueller@unido.org)
[t.chernyavskaya\(at\)unido.org](mailto:t.chernyavskaya@unido.org)

www.eap-green.org
www.unido.org/eapgreen
www.recpnet.org

The Regional RECP Demonstration Project is implemented under the EaP GREEN programme of the European Union with additional co-funding from the Government of Slovenia, the Development Bank of Austria and UNIDO.



REPUBLIC OF SLOVENIA
GOVERNMENT OF THE REPUBLIC OF SLOVENIA



Oesterreichische Entwicklungsbank AG