



# Petra Schwager



Petra studied Economics at the Vienna University of Business Administration and Social Sciences and Environmental Management at the University of London. She has extensive experience in developing and managing industrial resource efficiency and cleaner production programmes in developing countries and economies in transition, cooperating with governments, private sector, NGOs and academia in advancing sustainable production patterns and policies.

In 2004, she initiated UNIDO's global activities for the promotion of Chemical Leasing, an innovative circular economy business model that shifts the focus from increasing the sales volume of chemicals to the function of a chemical. Petra is the co-author of the book "Chemical Leasing goes global".



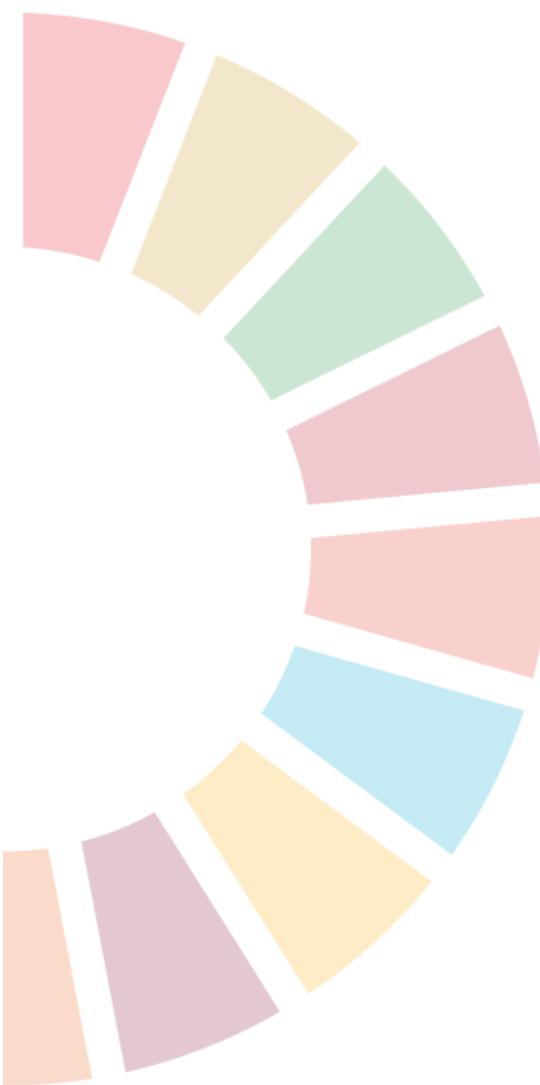
# *Chemical Leasing* *Innovative business model for* *resource efficiency*

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**Kigali Amendment - Vienna Talks**

**14 June 2017**





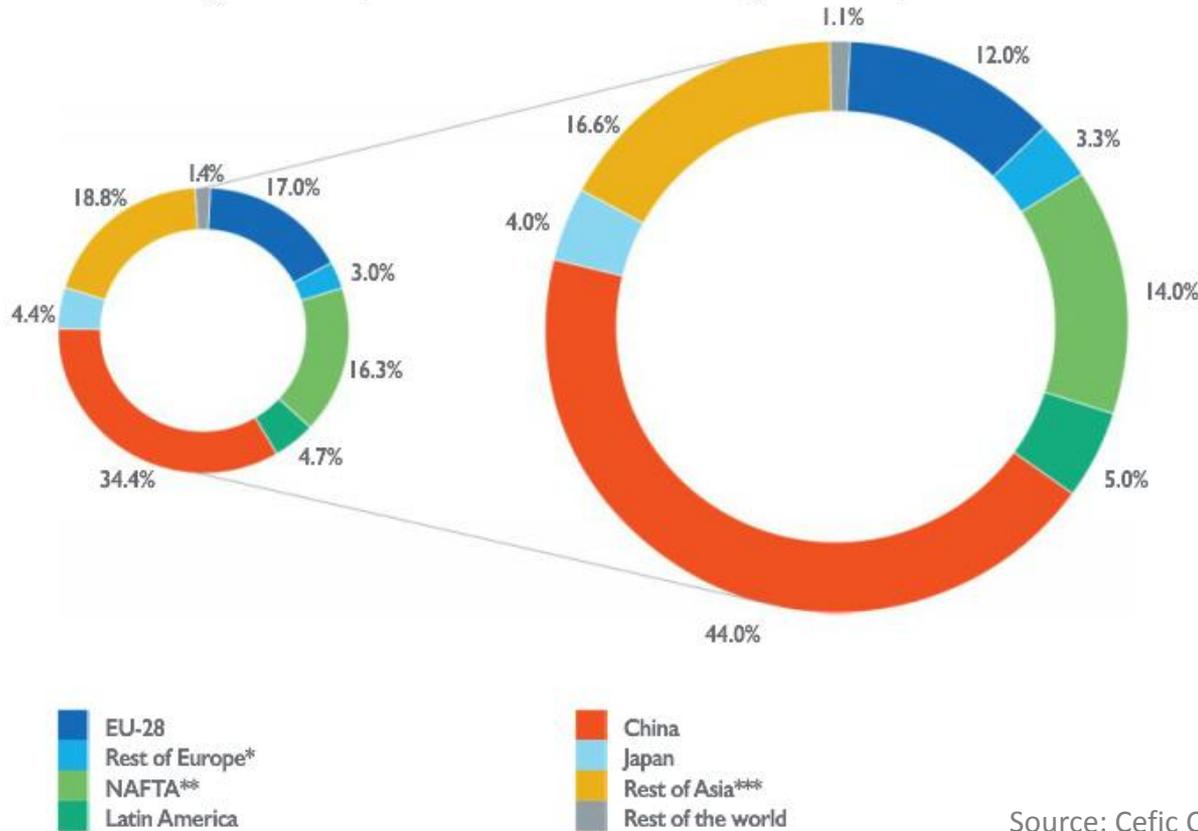
# Introduction



# Chemical Production Growth Forecast 2030

Sales 2014 (€3.2 trillion)

Sales 2030 (€6.3 trillion)



- Long-term analysis shows that overall growth of chemicals demand and production is to continue in the future
- World chemicals sales are expected to reach €6.3 trillion in 2030
- The global production, trade and use of chemicals are increasing (esp. in developing countries and countries with economies in transition)

Source: Cefic Chemdata International (2017)

\*Rest of Europe covers Switzerland, Norway, Turkey and Russia

\*\* North America Free Trade Agreement

\*\*\* Asia excluding China and Japan

## Global production of the four main HFCs

Chemical	Best estimate for Global HFC production in 2015 (ktonnes)
HFC-32	94
HFC-125	130
HFC-134a	273
HFC-143a	28
<b>Total</b>	<b>525</b>

Over the period **2015-2050**, the BAU scenario shows for the four main HFCs

- 250% growth in the demand in tonnes and in tonnes CO<sub>2</sub>-eq. in non-Article 5 Parties
- 700% growth in tonnes and a 800% growth in tonnes CO<sub>2</sub>-eq. in Article 5 Parties

Source: TEAP (September 2016), Montreal Protocol

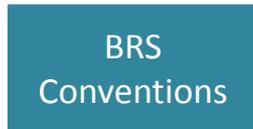


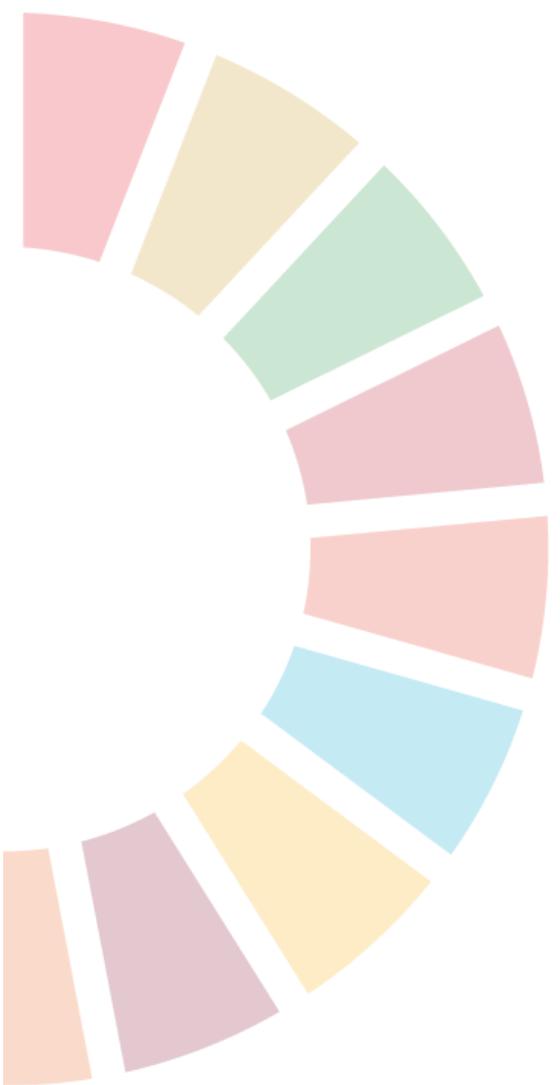
# Policy context

**Sustainable  
Development  
Goals**



**International  
Policy  
Frameworks**



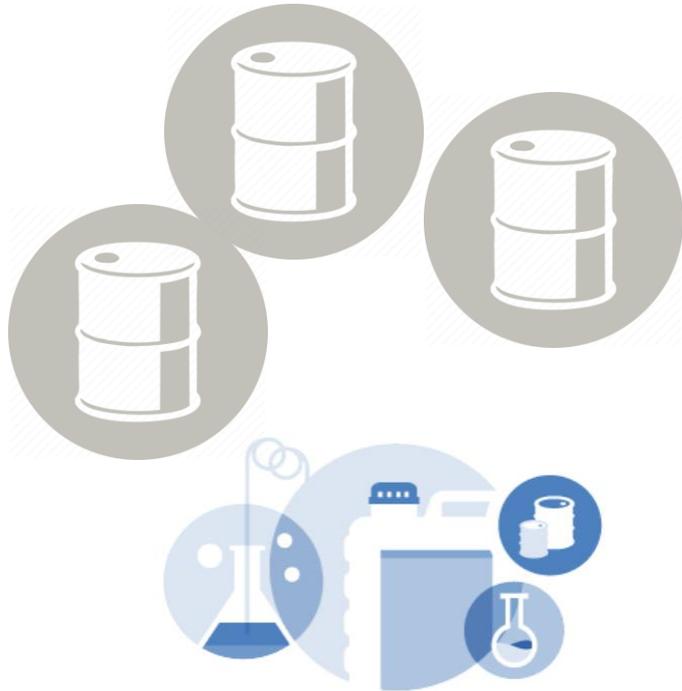


# Chemical Leasing - Innovative Business Model for Resource Efficiency





# From a product to a performance based model



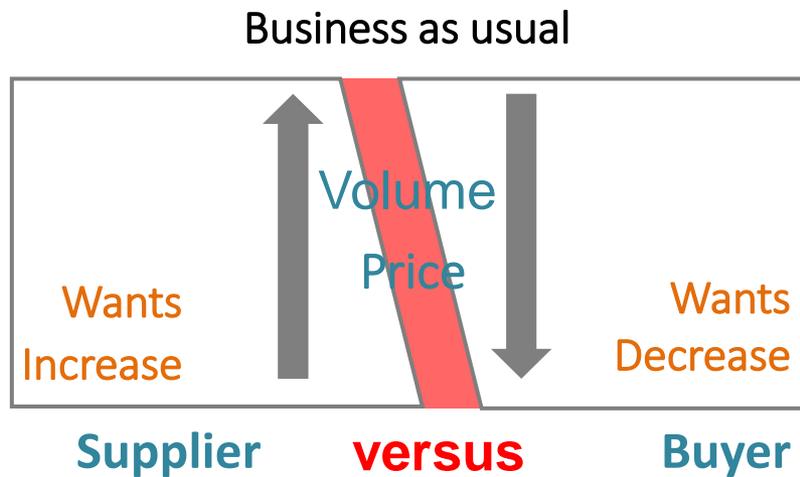
**Product orientation**



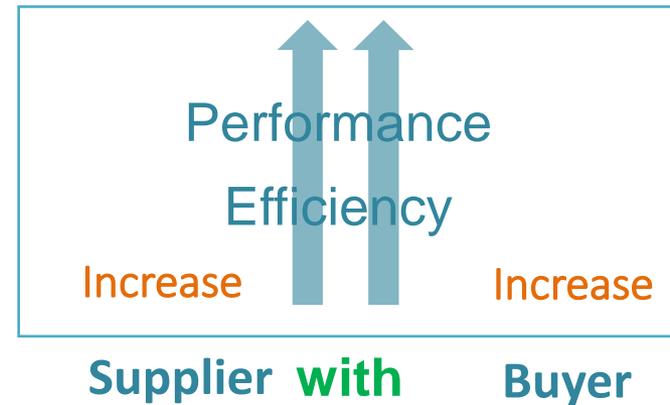
**Performance orientation**

# Chemical Leasing Essentials

## PERFORMANCE-ORIENTED BUSINESS MODEL



## Chemical Leasing



**Basis for Payment is the performance/service of a Chemicals**

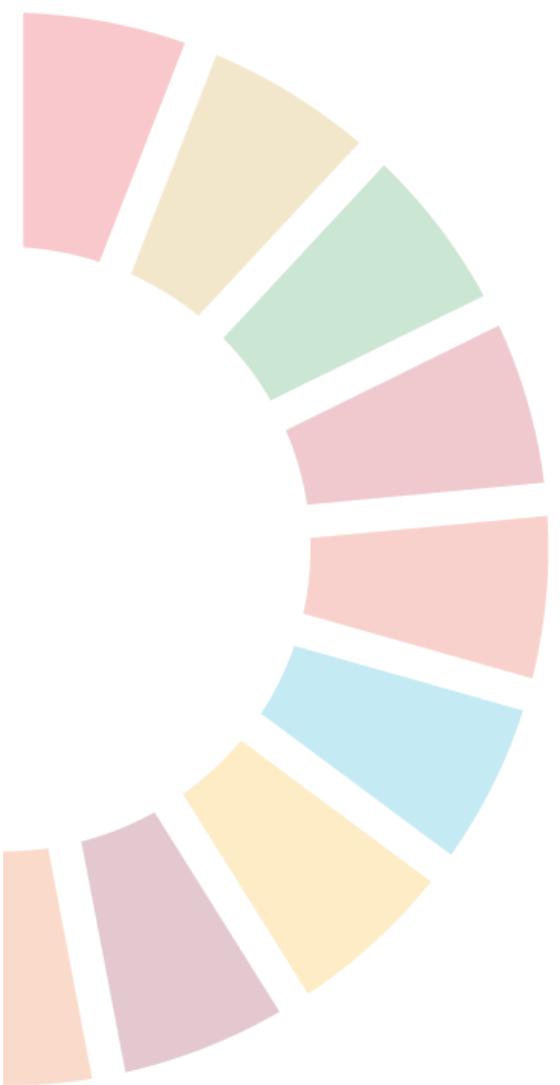


## Wide Applicability in various industry sectors

Successful Chemical Leasing examples for the following applications

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





# Chemical Leasing in Practise



## Example – Powder Coating



Powder coating



Classical business model: payment per t of powder coating

Chemical Leasing: payment per m<sup>2</sup> of coated surface

## Example – Food and beverage industry



Solvents,  
Cleaning agents

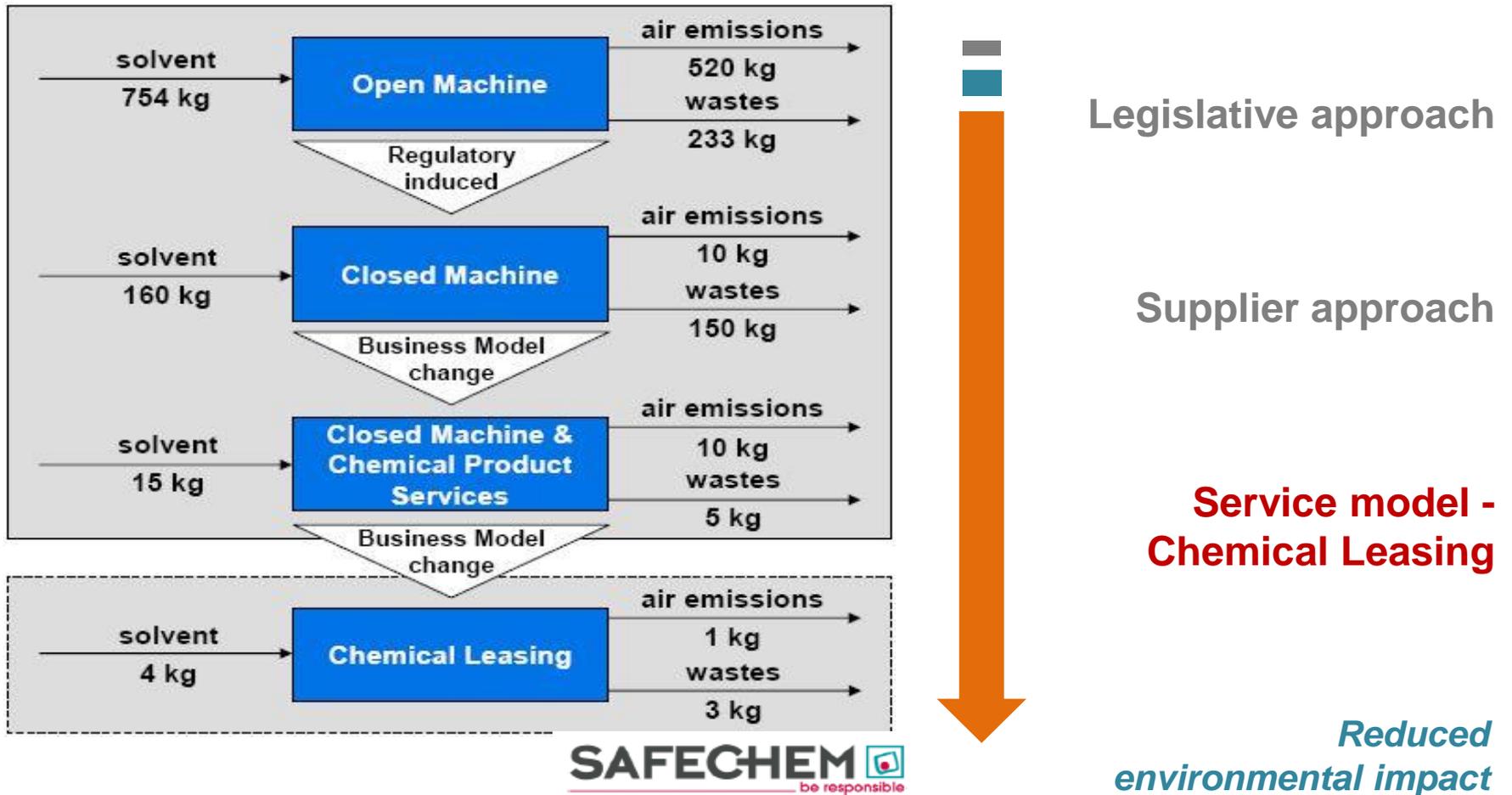


Classical business model: payment per t of solvents

Chemical Leasing: payment per outcome of the process, e.g. hl soft drinks

# Case study in Metal Cleaning - Safechem

A case study for *industrial surface cleaning*



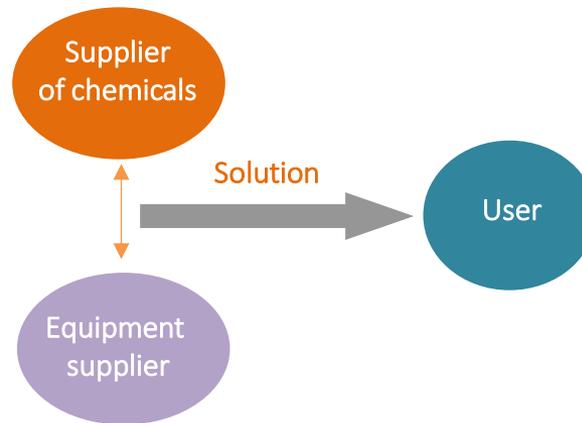
# Different constellations of the Chemical Leasing Business Model

## Model A



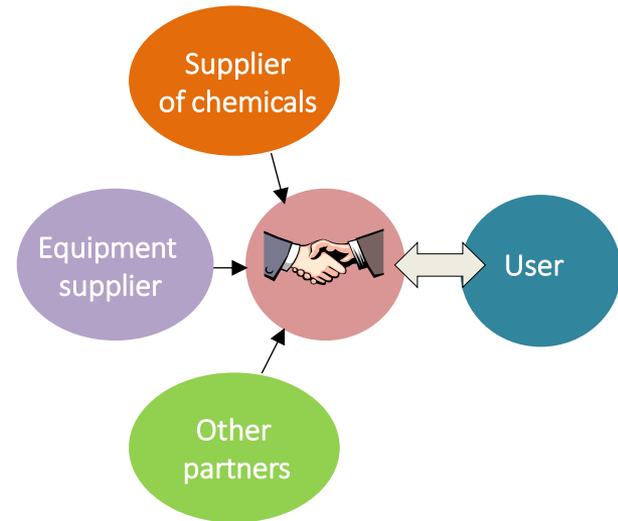
- Two partners: supplier and user of chemicals
- The user pays for the benefit of the chemical
- Both partners optimize chemicals use
- Material flow is closed

## Model B



- Chemicals supplier and equipment producer cooperate to improve efficiency of products
- The user pays for the complete solution and further optimizes it together with the two other partners

## Model C



- A joint venture bundles all interests of partners and generates synergies
- The user has one responsible partner and pays for the complete solution

## Case study in Metal Cleaning – SAFECHECM and PERO



### Results after 2 years

- Provided machines that are best qualified for the model
- Provided room and material logistics
- Provided the necessary human resources

- Provided the solvent for the cleaning process
- Monitored the quality of solvents
- Provided the waste management of the used chemicals
- Provided stabilizers

- Energy: reduced by 50.1%
- Spare parts and services: reduced by 66.4%
- Solvents: reduced by 71.7%
- Stabilizers: reduced by 76.9%

Chemical Leasing: payment per m<sup>2</sup> cleaned surface or per number of cleaned parts in car manufacturing

## UNIDO's Chemical Leasing Programme

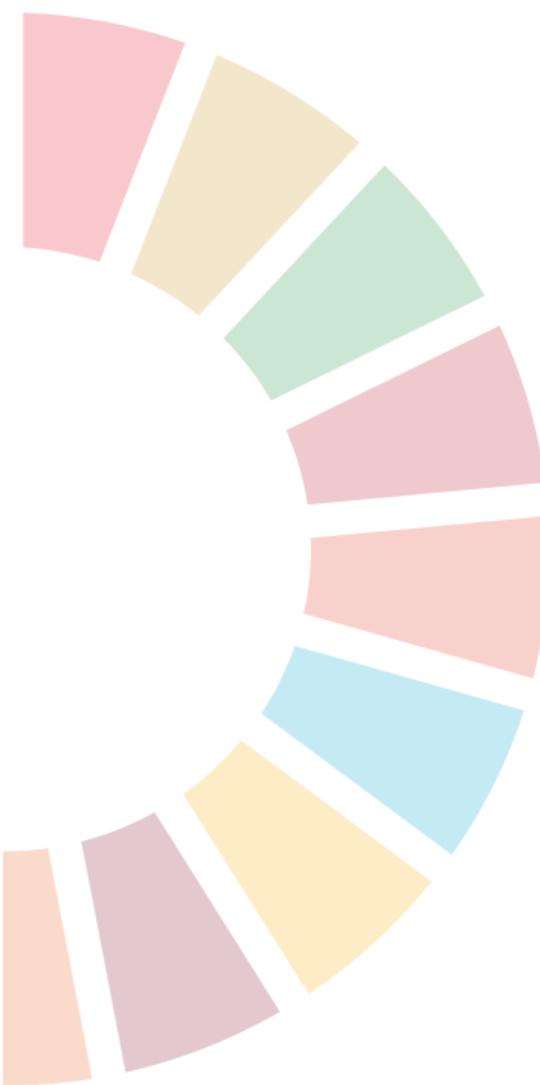
- Global Programme established by UNIDO in 2004
- Supported by the Governments of Germany, Austria and Switzerland
- Chemical Leasing Website: [www.chemicalleasing.org](http://www.chemicalleasing.org)
- Chemical Leasing Online Toolkit: [www.chemicalleasing-toolkit.org](http://www.chemicalleasing-toolkit.org)
- Global Awards 2010, 2012 and 2014
- The Declaration was signed by the partners from Austria, Germany, Switzerland and UNIDO on 21 November 2016 during the UNIDO 50th Anniversary



# Potential areas for Chemical Leasing with the Montreal Protocol activities

- Application of Chemical Leasing - Cooling systems
  - Renting of cooling containers/cooling space in i.e. supermarkets/hospitals/airport for food storage etc.
  - Cooling systems in containers provide extremely low temperatures down to  $-45^{\circ}\text{C}$  and cooling capacity range of up to 500kW per unit
  - Basis of Payment: Monthly fee based on performance
- Application of Chemical Leasing – Solvents (Substitution)
  - Methyl chloroform; CTC; and CFC-113 – are damaging the ozone layer, and several solvents are also powerful Volatile Organic Compounds (VOC) used in i.e. metal processing, printing industry, cleaning
  - Basis of Payment: Cleaned pieces, etc..
  - Substitution with new solvents





# Outlook & Conclusion



## Conclusion

### • Chemical Leasing

- UNIDO promotes the model in developing and transition economies
- It is a performance-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*



## A SMART business and policy model

**S**ound chemicals management

**M**onetary benefits

**A**dditional safety & health

**R**esource efficiency

**T**echnology innovation

Ms. Petra Schwager  
Environment Department / Industrial  
Resource Efficiency Division  
United Nations Industrial Development  
Organization  
[p.schwager@unido.org](mailto:p.schwager@unido.org)

