

SAFECEM Mission

We are The Service Company responsible for the sustainable and innovative use of chemicals

The SAFECEM Business Model – sustainable solutions for industrial cleaning

Bregenz, May 3, 2012

Vojislavka Satric, Cleaner Production Centre

Lionel Montémont, SAFECEM Europe GmbH



A Subsidiary of The Dow Chemical Company 

The SAFECHEM Business Model – sustainable solutions for industrial cleaning

SAFECHEM Europe GmbH

- **Subsidiary of The Dow Chemical Company**



Founded in 1992 in Germany

Today 40 employees serving Europe and North America

Located in Düsseldorf (Germany), Paris (France) and Midland, MI (USA)

- **SAFECHEM Mission:**

We are The Service Company responsible for the sustainable and innovative use of chemicals

- **SAFECHEM provides Industrial Surface Cleaning Solutions to more than 7500 customers**



The SAFECHEM Business Model – sustainable solutions for industrial cleaning

Chlorinated Solvents for high precision surface cleaning

- **Chlorinated Solvents are performance products for the surface cleaning industry:**
 - Products of choice since decades
 - Non-flammable
 - High degreasing potential
 - Low surface tension
 - High recycling potential
- **BUT Chlorinated Solvents have product specific risks which need to be managed:**
 - Ground penetration
 - Insufficient biodegradability in the ground
 - High emission level

The SAFECHEM Business Model – sustainable solutions for industrial cleaning

High quality solvent cleaning for your safety

- **High quality industrial surface cleaning is indispensable for human progress:**

- Aeronautic industry
- Automotive industry
- Measuring instruments
- Safety components
- Surgical instruments



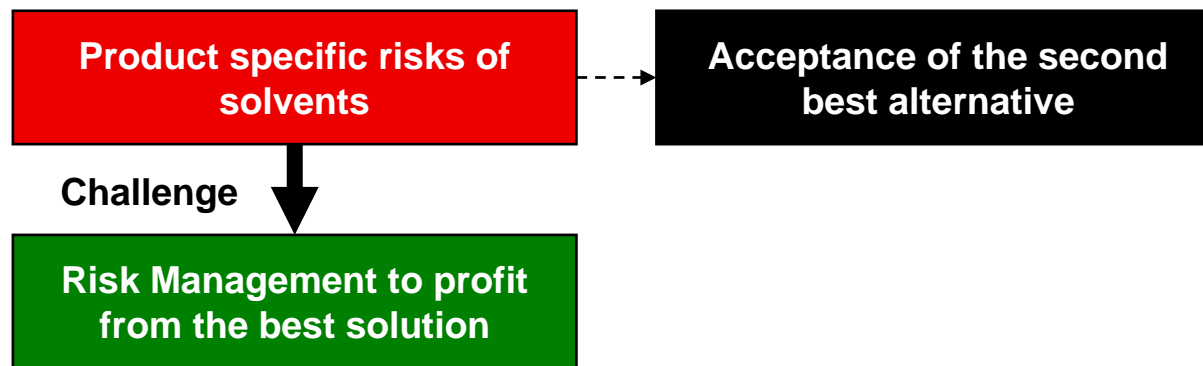
- **Effective Risk Management enables the sustainable use of chlorinated solvents:**

- Storage, transport and handling in closed loop safety systems and use in closed equipment
- Service elements for maintenance and quality
- Training and application know-how from experts along the entire supply chain:

www.chemaware.org

The SAFECHEM Business Model – sustainable solutions for industrial cleaning

Risk Management in a Cradle to Cradle Business Model



Sustainable Development

Environmental Responsibility

SAFE-TAINER™ System:

- Unique and state-of-the-art closed loop delivery system

Service Elements:

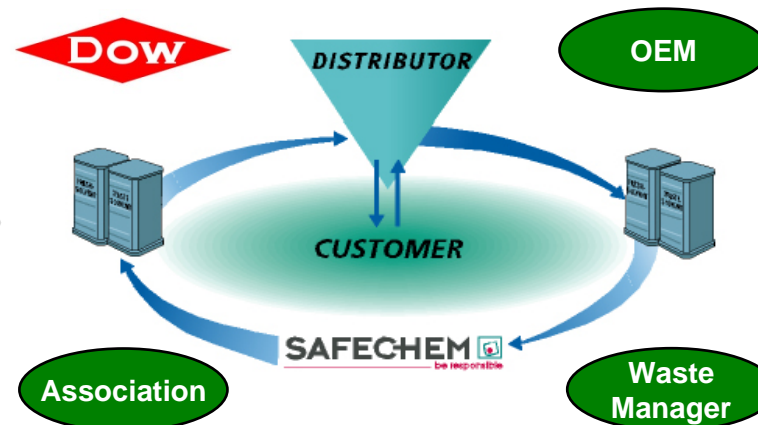
- Wide range of service elements for customized solutions

Service Alliance:

- Close cooperation with all stakeholders along the supply chain

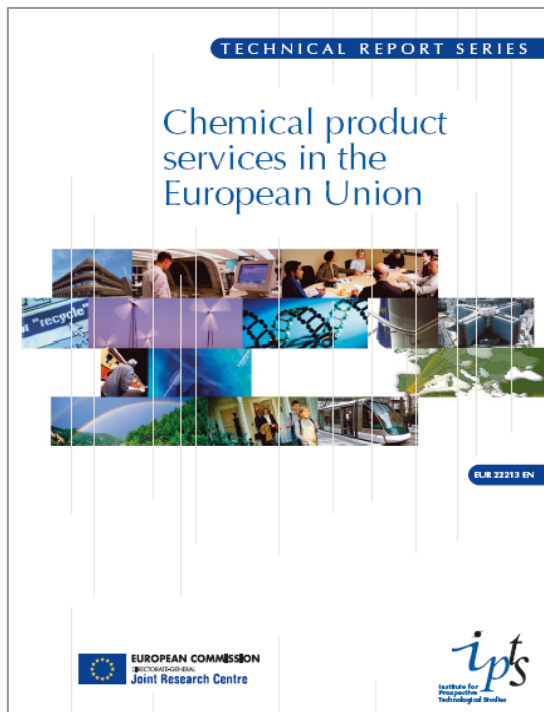
Continuous development:

- Start-up of innovative business models like Chemical Leasing

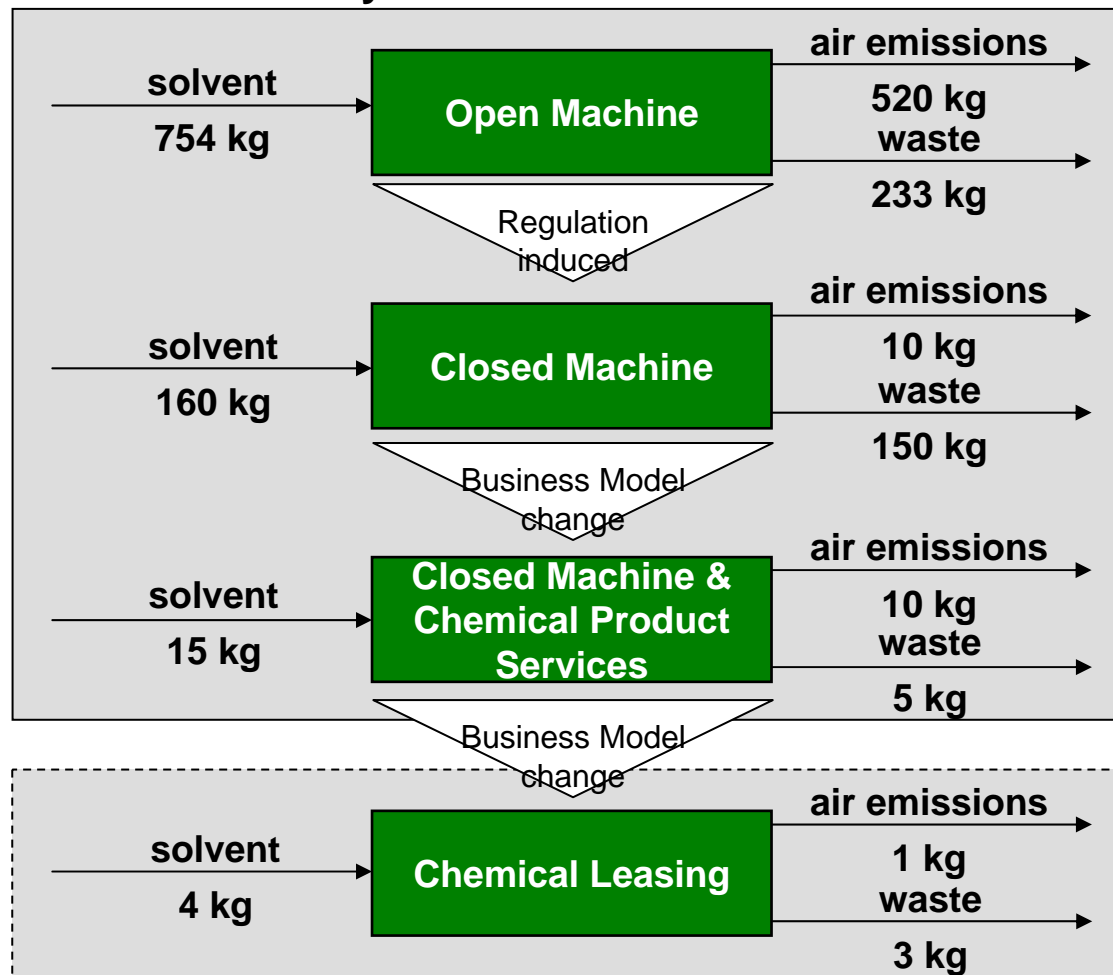


The SAFECHEM Business Model – sustainable solutions for industrial cleaning

Chemical Product Services increase solvent efficiency

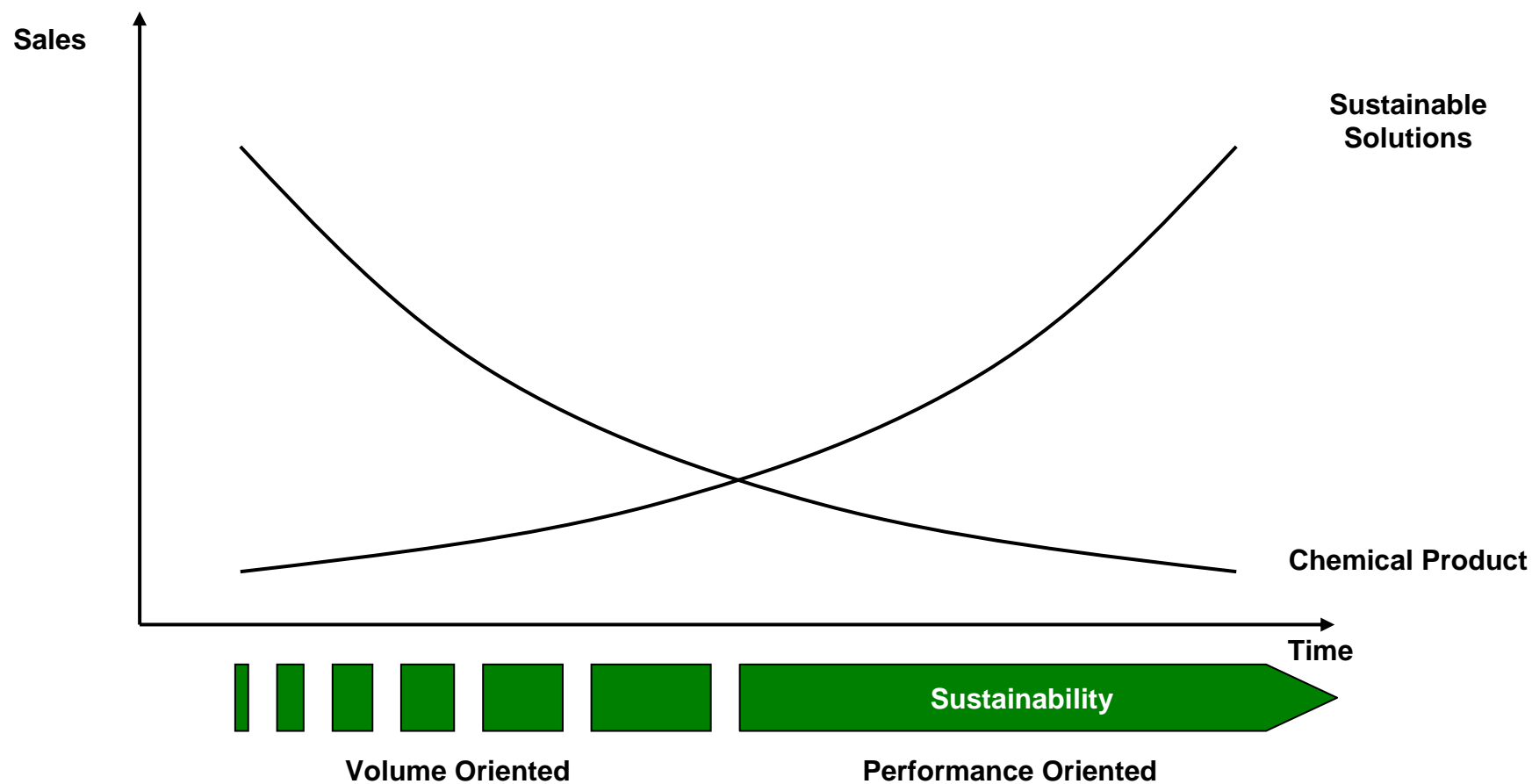


Amounts per 100 kg oil removed



The SAFECHEM Business Model – sustainable solutions for industrial cleaning

Paradigm Shift

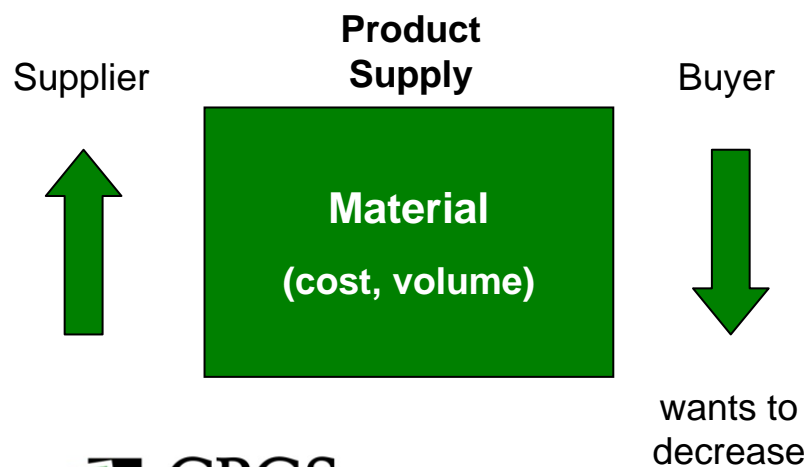


The SAFECHEM Business Model – sustainable solutions for industrial cleaning

Chemical Leasing

- Full and optimized solution package for high performance industrial cleaning
- High quality cleaning results, increased cleaning efficiency, and optimized environmental profile
- Invoicing: full solution package based on the cleaning performance – fee per cleaned part or per month
- Optional: leasing of state-of-the-art closed cleaning equipment

Traditional Relationship: Conflicting incentives



Chemical Leasing Models: Aligned incentives



The SAFECHEM Business Model – sustainable solutions for industrial cleaning

COMPLEASE™ Chemical Leasing

Solvents

- High quality solvents: DOWPER™ MC, DOWPER™ N, NEU-TRI™ E, NEU-TRI™ L, DOWCLENE 1601, DOWCLENE 1611, DOWCLENE™ 1621
- Safe delivery in the SAFE-TAINER™ system

Cleaning Equipment

- State-of-the-art cleaning machine
- Machine maintenance and service
- Accessories

Waste Management Services

- Take back of used solvent in the SAFE-TAINER™ system
- Waste analysis
- Documented waste management streams

Services

- MAXICHECK™ on-site quality monitoring
- Comprehensive laboratory analysis
- MAXISTAB™ stabilisation system / MAXIBOOST™ solvent additives
- Logbook
- Technical service and consultancy

CHEMAWARE™ Know-how

- Extensive trainings & consultancy
- Expertise and know-how about regulatory framework and Responsible Care®
- Lobbying and campaigning for the sustainable use of solvents



The SAFECHEM Business Model – sustainable solutions for industrial cleaning

COMPLEASE™ Chemical Leasing



- Supply in SAFE-TAINER™ system as part of the “Cradle-to-Cradle” principle
- Dow branded solvents

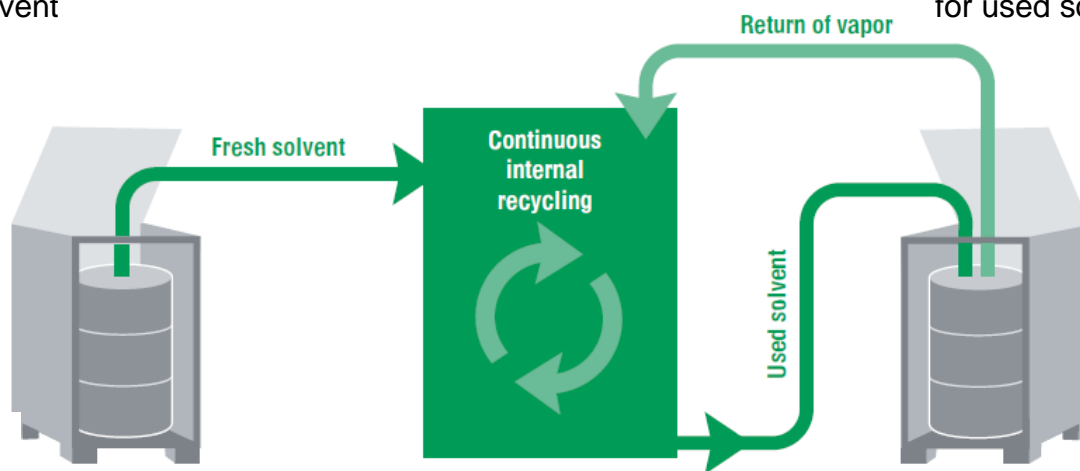
- Process optimisation:
- Solvent Maintenance and comprehensive services
 - Technical process optimisation

- Take-back of used solvent in the SAFE-TAINER™ system
- Waste analysis feedback

- SAFE-TAINER™ system for fresh solvent

- Closed cleaning machine

- SAFE-TAINER™ system for used solvent



Chemical Company (“Dow”) or an affiliated company of Dow



The SAFECHEM Business Model – sustainable solutions for industrial cleaning

COMPLEASE™ Benefits for the Customer

Process optimization

- SAFECHEM products and service solution
- High-performance cleaning equipment
- Adjustment and optimization of all process parameters

Continuous process improvement towards highest quality and economic efficiency

Bundled know-how from all cleaning process partners involved

High precision cleaning quality while complying with relevant regulations and meeting the principles of Responsible Care®

Competitive advantage and investment security

Cost transparency and economic value

Improvement of social behavior and image of brand and company



mark of The Dow Chemical Company ("Dow") or an affiliated company of Dow
ered Service Mark of the American Chemistry Council

FKL Case study

Factory for ball bearings and cardan shafts



A Subsidiary of The Dow Chemical Company 

Partners

- FKL
- SAFECHEM
- RESINEX (SAFECHEM representative in Serbia)
- PERO (equipment producer) and
- Cleaner Production Centre of Serbia

Cleaning process

Parts to be cleaned are packed into baskets. The cleaning process contains an immersion phase to dissolve oils and grease with, ultrasonic to remove metallic chips. Then the basket moves into the vapor phase to be finished and dried.



Cleaning process

- During the process concentrations of cutting fluid, oils, fat and their decomposition are increasing in the solvent bath. Under certain operating conditions the contaminants may decompose and may lead to acidification of the solvent.
- The working life of the solvent is significantly reduced by acidification.
- Metal parts to be cleaned may also corrode and the machine itself may be damaged by the acid.

Current situation

- There are two closed machines that are designed to work with trichloroethylene
- Trichloroethylene for metal parts cleaning is substituted by tetrachloroethylene (standard grade)
- FKL works 7 days a week in three shifts and the yearly consumption of tetrachloroethylene is about 30 t



Current situation

- Due to the substitution, higher temperatures are needed for cleaning operation (boiling point under normal pressure for TRI is 87⁰ C, for PERC 121⁰ C)
- In the course of the cleaning process more oils are mixed with solvent and higher temperature is needed to create vapors

Current situation

- Due to the fact that solvent gets contaminated during the week, the quality of cleaning results decreases noticeable in the course of the week (co-distillation and particles burned on parts);
- Baths are exchanged (300 l each) every week;
- 25 t of solvent waste is produced yearly;
- Content of the solvent in the waste is about 90%;
- There is heavy corrosion of machine parts

Implementation of the ChL Model

- Perchloroethylene standard grade is substituted by metal cleaning grade (stabilized)
- Safe supply in line with the principles of Responsible Care®.
- Effective risk management is provided as emissions are kept to a minimum.



Implementation of the ChL Model

- Safe handling – due to completely closed system for fresh and used solvent associated to SAFECHEM accessories for hermetical connections
- Solvent maintenance:
Parameters of the solvent in the machines will be controlled and adjusted to the optimum by additives that will be delivered



Implementation of the ChL Model

- Distillation unit will be delivered – solvent is going to be distilled twice a week;
- Take-back of used solvent in the SAFE-TAINER™ system;
- Employees will be trained on the proper and safe use of the solvent

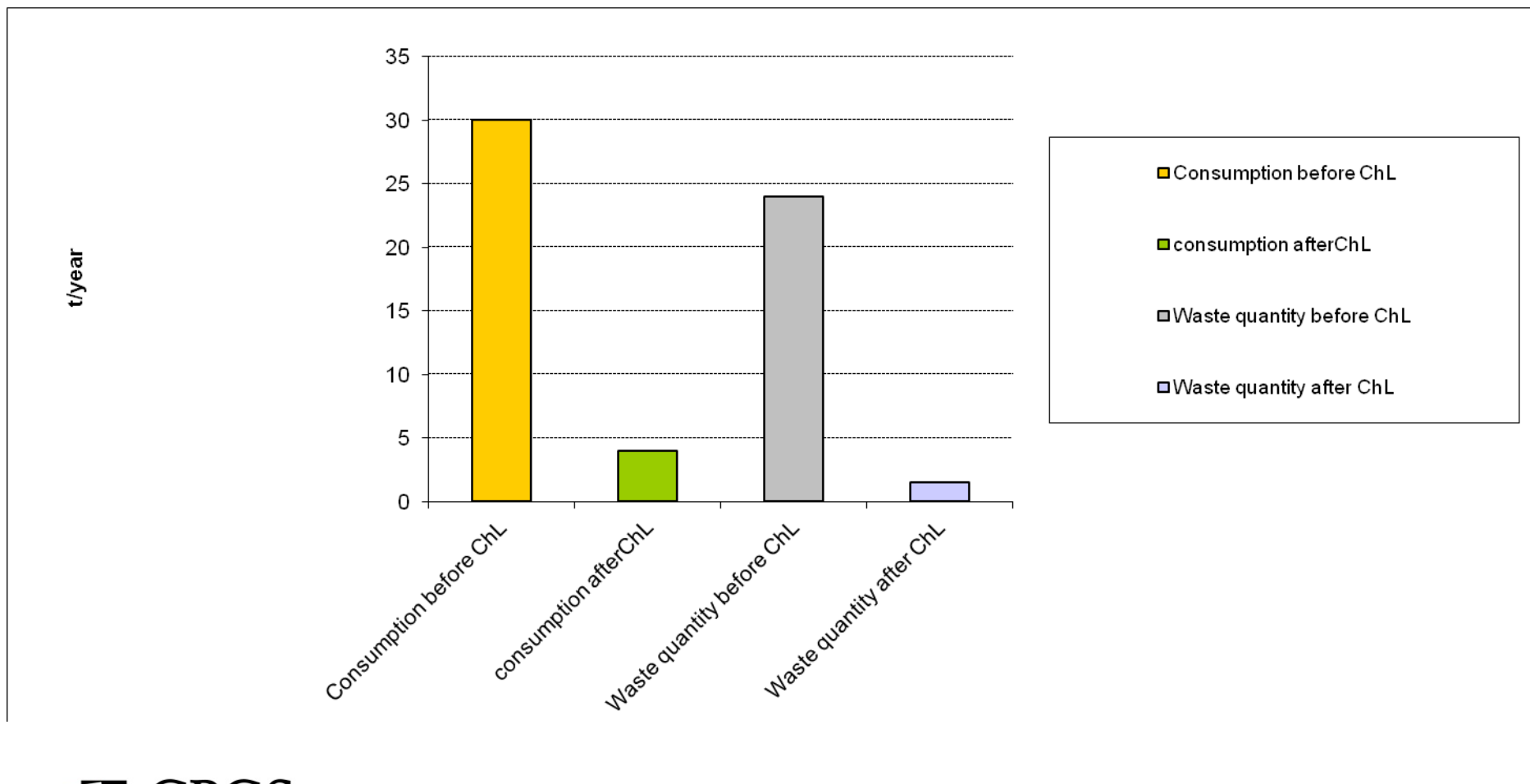
The unit of payment

Invoicing is based on the efficiency of the cleaning process

FKL pays monthly fee

FKL and SAFECHEM share the same objective: maximizing the efficiency of the cleaning process and reducing the solvent consumption.

Resource efficiency



Environmental benefits

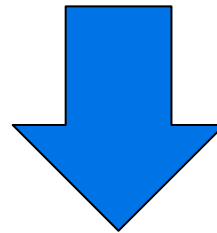
- The quantity of the hazardous waste will be significantly reduced. It is expected to produce not more than 1.5 t/year;
- The hazardous waste will be managed in a safe way;
- Air emissions (both canalized and diffused) will be reduced due to lower working temperatures

Occupational health and safety

- The system will be closed and the solvent transfer will be managed via hermetical connection. There is virtually no possibility that employees get in contact with the solvent and virtually no emissions to the working environment;
- Basically all risks related to the chemical will be managed.

Quality improvement

- The equipment enhancement will help to reduce the quantity of oil in the solvent and keep temperature stable.
- The cleaning machines will work at lower temperature



Quality of cleaning will be uniform

Process improvement

In the last two years FKL has doubled its production and cleaning process has become the key point in terms of quality and productivity

- Increased capacity of cleaning due to increased number of parts per basket and shorter cleaning cycle
- Better line productivity (there will be not down time due to weekly change of the solvent and maintenance of the machines)

Economic benefits

Expected savings are higher than 15% calculated without

- maintenance costs,
- downtime costs and
- the waste export costs

Benefits for SAFECHEM

The ChL model enables SAFECHEM to:

- consequently apply the principles of Responsible Care®. This leads to an improved environmental profile;
- closely work with customers and optimally adjust the cleaning process parameters. The solvent consumption will be noticeably reduced and the performance and services will be sold.



THANK YOU VERY MUCH FOR YOUR
ATTENTION

www.safechem-europe.com

www.chemaware.org

www.chemicalleasing.com