International Conference

"Getting Fit for REACH
Applying Chemical Leasing"
INTERNATIONAL CONFERENCE

„Getting Fit For REACH
Applying Chemical Leasing“

March 6th – 7th 2008
Balatonfüred, Hungary

Conference Report

With contribution of:
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PROGRAMME

Wednesday, March 5th 2008
18:00 Reception from the Mayor of Balatonfüred, Mr. István Bóka

Thursday, March 6th 2008
Chair: Zoltán Szabó
President of the IFCS (Intergovernmental Forum on Chemicals Safety)

09:00 Registration
10:00 Welcome: MEP Mrs Edit Herczog, Ambassador Mr. Mayrhofer-Grünbühel
10:00 REACH and Chemical Leasing: Two concepts and their synergies; Thomas Jakl (Director, Austrian Fed. Ministry for the Environment)
10:50 Chemical Leasing and outcomes of case studies; Reinhard Joas (CEO Bipro, Munich)
11:30 Coffee Break
11:45 REACH – a shift of paradigm and its consequences for stakeholders in Central Eastern Europe; Gyula Körtvélyessy (Hungarian Chemical Society)
12:30 Cleaner Production and Chemical Leasing – a win-win approach; Petra Schwager (UNIDO)
13:15 Film: “Chemical Leasing Business Models - A video on UNIDO Chemical Leasing Activities”
13:30 Lunch Break
14:30 Workgroups: specific parameters for different industries.
   Workgroup 1: Automotive Industry; Chair: Hans-Norbert Adams (Dow Europe GmbH)
   Workgroup 2: Colouring and Varnish Industry; Chair: Mark Reekie (Akzo Nobel Powder Coatings Ltd)
   Contents: Basic conditions for the usability of the concept, identification of pilot projects and initiatives, necessary infrastructure and possible assistance
17:15 Presentations from working groups
18:00 Summary of the day

Supporting Programme in the Evening:
19:00 Departure to Veszprém (with busses)
19:30 Dinner (buffet)
   Reception through comitat-president Jenő Lasztovicza in Veszprém with wine tasting and folklore music;
   With contribution of Springer
Friday, March 7th 2008

09:00  Presentation of the book „Chemical leasing goes global“, Publishing house Springer - Vienna, New York
Conference participants will receive a free copy of the book on Friday morning!

09:30  Panel Discussion:
„Chemical leasing – a contribution to sustainable development?“

Participants: Reinhard Joas (Bipro), Klaus Günter Steinhäuser (Federal Environment Agency, Germany), Thomas Jakl (Austrian Fed. Ministry for the Environment), Mark Reekie (Akzo Nobel), Petra Schwager (UNIDO)

Chair: Gyula Zilahy (Corvinus University of Budapest)

11:30  Closure

12:00  Coffee lunch

Optional Supporting Programme in the Afternoon:
City Tour Veszprém
14:30  Departure (with busses)

Conference Venue:

Flamingo Wellness Hotel ****

H-8230 Balatonfüred, Széchenyi u. 16

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During the conference all lectures are translated simultaneously in Hungarian!
CONFERENCE SUMMARY

The first get together of the participants had already been on Wednesday evening at a small reception at the conference venue hosted by the Mayor of Balatonfüred, Mr. István Bóka. The participants had the chance to get to know each other and the first ideas and expectations in relation to Chemical Leasing had been exchanged.

Day 1 - March 6th 2008

The first conference day started with a welcoming session started off by Mr. Jakl, representing the host of the conference followed by MEP Mrs Herczog and the Austrian Ambassador Mr. Mayrhofer-Grünbühel. They stressed the importance of this conference and were pleased to welcome all participants in Veszprém. The whole day was chaired by Zoltán Szabó, President of the IFCS (Intergovernmental Forum on Chemicals Safety).

Starting with the block of theoretical inputs Mr. Thomas Jakl (Director of the Chemicals Policy Unit of the Austrian Federal Ministry for the Environment) showed in his presentation the synergies of the two concepts of REACH and Chemical Leasing (see page 13).

In the following presentation by Mr. Reinhard Joas (CEO of Bipro, Munich) several outcomes of different case studies had been shown. Furthermore he stressed the importance of the concept of Chemical Leasing as an opportunity for an optimised use of chemicals (see page 22).

The third presentation dealt with REACH itself. Mr. Gyula Körtvélyessy (Honorary Secretary General from the Hungarian Chemical Society) talked about the regulation and its consequences for stakeholders in Central Eastern Europe and highlighted important cross references and interlinkages between REACH and Chemical Leasing (see page 36).

To conclude the theoretical inputs Ms. Petra Schwager (Industrial Development Officer for Cleaner Production Program from UNIDO) showed how Cleaner Production and Chemical Leasing can be designed to be a win-win approach (see page 49).

After lunch a short film about UNIDO activities in the field of Chemical Leasing was shown. Several business models in relation with Chemical Leasing were picked out as central themes showing the experiences and illustrating benefits.

Afterwards the participants split into two workgroups where specific parameters for different industries had been dealt with. Basic conditions for the usability of the concept, identification of pilot projects and initiatives, necessary infrastructure and possible assistance were topics discussed in the workgroups.
Workgroup 1: Automotive Industry

Christian Plas (denkstatt) and two experts from the chemical industry, Hans-Norbert Adams (Dow Europe) and Markus Frank (Safechem Europe) were chairing the workgroup. After an input from Mr. Adams and Mr. Frank about the experiences of Dow/Safechem with Chemical Leasing (see appendix II) Mr. Plas and the experts discussed the pros and contras of Chemical Leasing in the automotive industry with the interested participants.

Benefits of the Chemical Leasing Model:

- Organisations which are facing quality problems are more likely to get involved in Chemical Leasing.
- Chemical Leasing is even possible with small volumina <1t/a.
- Strict legal (environmental) restrictions may motivate companies.

Drawbacks of the Chemical Leasing Model:

- There is already an optimised system in place.
- Existing laws are executed weakly.
- Economic legal restrictions may prevent companies to involve in Chemical Leasing.
- Confidential/secret processes are involved which may be difficult for companies concerned.

Workgroup 2: Colouring and Varnish Industry

The second workgroup was chaired by Zsombor Ferjancsik (denkstatt Hungary) and the expert Mark Reekie (Akzo Nobel Powder Coatings Ltd), who gave an initial presentation about the experiences of Akzo Nobel with Chemical Leasing (see appendix III). Afterwards they had a very lively discussion about several aspects related to Chemical Leasing in the specific industry as well as in general.
Chemical Leasing Aspects:
- Suppliers involved in training.
- Chemical Leasing involves intense discussion more than REACH demands.
- Chemical Leasing is to be made like a project.
- It is a matter of learning and can then be implemented at other places.
- Biggest challenge to change attitude and mind.
- Chemical Leasing is mostly not core business of the user, but core business of the supplier.
- It is important to build trust.

Economic Aspects of Chemical Leasing:
- Costs of improving process,
- Market driven,
- Price should include additional service,
- Tax reduction to support process.

Measures for Promotion of Chemical Leasing:
- CPC’s cannot do it alone,
- Use good case studies,
- Industry involvement,
- Importers from outside of small countries do not have all the information => Support from suppliers for training etc.

Afterwards the outcomes of the workgroups were presented in the plenary. The day was closed with a short summary of the day by Mr. Jakl and Mr. Szabó.

Further opportunities and cooperation plans had the chance to arise at the supporting program in the evening, a reception through comitat-president Jenő Lasztovicza in Veszprém.
Day 2, March 7th 2008

The second day started with the presentation of the recently published book „Chemical leasing goes global – Selling Services Instead of Barrels: A Win-Win Business Model for Environment and Industry“ (Publishing house Springer - Vienna, New York). The book collects the experience gained from pilot projects in Austria, Egypt, Russia and Mexico. It contains detailed descriptions and evaluations based on existing projects, as well as political and scientific interpretations and analyses. The editors, Mr. Thomas Jakl (Austrian Federal Ministry for the Environment) and Ms. Petra Schwager (UNIDO) also described the background and the origin of the book.

The second main point on that day was a panel discussion chaired by Gyula Zilahy, Corvinus University of Budapest. Klaus Günter Steinhäuser (Federal Environment Agency, Germany), Thomas Jakl (Austrian Federal Ministry for the Environment), Petra Schwager (UNIDO), Mark Reekie (Akzo Nobel) and Reinhard Joas (Bipro) discussed about „Chemical leasing – a contribution to sustainable development?“

Following topics were discussed:

- The benefits and constraints of the practical implementation of Chemical Leasing.
- What can governments do to promote Chemical Leasing: policy tools available?
- The role of CP centers in the promotion of Chemical Leasing.
- The importance of a mediator in Chemical Leasing projects.
- The relationship between Chemical Leasing and other environmental management tools – how can they strengthen each other?
- Tools for UNIDO, ministries and National Cleaner Production Centers to promote Chemical Leasing at the corporate level.
The following points resulted from the panel discussion:

Chemical Leasing is a promising new tool to be used by the chemical industry as well as those industries using significant quantities and toxic chemicals.

There are many examples of Chemical Leasing-like solutions, but environmental aspects are often not considered or have a smaller weight during the implementation. The environmental benefits often do not serve as only motivation factors for Chemical Leasing projects, but partners implement them for other (e.g. efficiency) reasons.

Furthermore, contracts based on service provided to customers (as opposed to the selling of chemicals) do exist in the industry, but are often not called “Chemical Leasing” and are not fully utilizing their environmental potentials.

One of the most important barriers to Chemical Leasing is the lack of trust between potential partners. Therefore the most important potential role of national CP centers in the field of Chemical Leasing is the role of a mediator: it seems that many projects may not reach implementation because of a lack of a good third party mediator, which can be trusted by both parties.

Chemical Leasing should stay a voluntary tool practiced by the corporate sector, but market based incentives should be provided to the companies. Certification may play a role in Chemical Leasing cooperations, but certification should be industry driven. A good tool would be the establishment via a Chemical Leasing Award by UNIDO, the Austrian Federal Ministry of the Environment and other partner organisations. These institutions will look into the possibilities to set up a Chemical Leasing Award in the next one or two years for those companies, which can demonstrate the successful implementation of Chemical Leasing projects, as well as significant environmental benefits resulting from them.
Main outcomes of the conference:

Cooperations for future activities:
Due to the great variety of nations participating at the conference several experiences from institutions and companies in countries already engaging in Chemical Leasing projects had been exchanged. Additionally, possibilities for new cooperations had been discussed and established.

Framework needed for engaging in Chemical Leasing:
In order to motivate companies to engage in Chemical Leasing activities, several preconditions should be given. First of all the participation in Chemical Leasing should remain a voluntary decision although there is the demand for some market based incentives which should be provided. Certification has been discussed but is not seen as urgently necessary. Furthermore, a mediator should be involved in order to build up trust and confidence from the participating companies in the implementation of projects. The Cleaner Production Centers would be appropriate to this role.

For the promotion of Chemical Leasing good case studies should be used and industry should be broadly involved. Additionally, support from suppliers for trainings and other information are needed.

REACH was seen to a great extent as paving the way for Chemical Leasing approaches as it is going to establish a new quality of interaction between actors along the supply chain. The conference drew the conclusion that Chemical Leasing has the potential to make use – both economically and environmentally - of the information REACH will generate and of the communication paths it will establish.

Preparation of an Award for Chemical Leasing activities:
The award is planned to be established by UNIDO, the Austrian Federal Ministry for the Environment and other partner organisations. All companies, which can demonstrate the successful implementation of Chemical Leasing projects, as well as significant environmental benefits resulting from them, will be able to apply for the award. As a next step the possibilities to set up the award in the next one or two years are checked.

This conference was another contribution to the further establishment manifestation of Chemical Leasing. Although there were many points coming up during the conference there are still questions to be discussed:

- Legislation – assistance or obstacle?
- What is the role of trading companies?
- What motivates the companies to discuss issues that might be part of their intellectual property?
UNIDO Definition of Chemical Leasing

Chemical Leasing is a service-oriented business model that shifts the focus from increasing sales volume of chemicals towards a value-added approach. The producer mainly sells the functions performed by the chemical and functional units are the main basis for payment.

Within Chemical Leasing business models the responsibility of the producer and service provider is extended and may include the management of the entire life cycle.

Chemical Leasing is a win-win situation. It aims at increasing the efficient use of chemicals while reducing the risks of chemicals and protecting human health. It improves the economic and environmental performance of participating companies and enhances their access to new markets.

Key elements of successful Chemical Leasing business models are proper benefit sharing, high quality standards and mutual trust between participating companies.

www.unido.org
REACH and Chemical Leasing, Thomas Jakl

REACH and Chemical Leasing
two concepts and their synergies

REACH has been devised specifically to meet the political challenges of Europe's environmental policy with regard to chemical products as they are contained in the EU's 6th Action Program for the Environment. **REACH** establishes a single, integrated system for Registration, Evaluation and Authorisation of Chemicals. It is requiring companies that produce and import chemicals to assess the risks arising from their use and to take the necessary measures to manage any risk they identify.

With the new conditions and the new circumstances, the REACH – System will establish, the conventional paradigm that chemicals are just sold by one side and purchased by the other without any further exchange of information, can not survive. The responsibilities are too interwoven and deep-seated so that the importance of the relationship between manufacturer and user of chemicals can no longer be judged by commercial indicators only.

REACH and **Chemical Leasing** are mutually supportive as they both stimulate the development of rules for „sharing“. Within REACH costs of test will have to be shared among companies registering the same substance. Companies will have to share responsibility as to the documentation of the properties of a chemical substance as well as with regard to the risks that might occur during its application. This culture of sharing, which might be a new cultural element in the relationship of business partners, is also a prerequisite for success in service oriented business models as they equivalently depend on a high degree of openness and trust between the partners involved.

Both Approaches involve different stages of the supply chain - as producers and applicants are challenged – and both approaches are life cycle oriented either through their documentation requirements addressing phases of production, use or disposal or through their integration of the corresponding partners managing those life cycle stages within the business model. Chemicals are to be handled with care both in the REACH world as well as within applications of Chemicals Leasing. Care in that context in particular implies that Chemicals and their applications are not only monitored but also managed with maximum accuracy.

REACH represents the regulatory driver for this attitude aiming at protection for human health and the environment ("Duty of care" in the, Reach Regulation Recital 16, Art. 1 para 3; monitoring requirements Art 14.6. for manufacturers; Art 37.5. Down Stream users) whereas **Chemical Leasing** is additionally driving it economically as resource efficiency simply increases profit.

**Chemical Leasing** is the tool to demonstrate “adequate control” (Para 60), a set of parameters which have to be fulfilled in order to qualify for a use to become authorized. Experience shows that chemicals are managed excellently within Chemical Leasing applications and in case that in certain applications the use of “very high concern chemicals” is inevitable – adequate control will be achieved as an inherent principle within service oriented business models as “handling with care” is their core element.
Chemical Leasing is the ideal business environment to identify and apply the use and exposure category concept in particular within the Chemical Safety Report – jointly by suppliers and users. Specifying the relevant use and exposure category within the REACH system, together with qualifying the risks possibly arising will build upon the assessment already performed during the establishment of the specific Chemical Leasing model.

REACH is going to mandate along the supply chain Information exchange, Monitoring procedures, Patterns for Sharing and Co-operation as well as Documentation and assessment procedures. Chemical Leasing opens a window of opportunity for turning new obligations, new responsibilities and new flows of information into successful business strategies.

Presentation by:

Thomas JAKL
Director, Chemicals Policy Unit, V/2
Austrian Federal Ministry of Agriculture, Forestry, Environment and Water Management
REACH and Chemical Leasing
Two concepts and their synergies;

Dr. Thomas Jakl
Austrian Ministry for the Environment
Head of Chemicals Policy Unit

“Chemical Leasing”
- the message in a nutshell

- Chemical products provide a broad variety of services (cleaning, coating, greasing...)
- The focus of economic interests is currently on the volume of products rather than on services.
- Shifting the focus more toward the “service-part” stimulates economically driven “care”
- It is in the interest of all the parties involved to use the substances with maximum efficiency
The Austrian Experience

- 4,000 Austrian companies (mainly SMEs) would basically qualify for the application of such models

- Cutting today’s annual use of 153,000 tonnes of chemicals by one third - 53,000 tons per year that would not have to be used nor paid for, not result into emissions nor waste

- On average, the users of these new business models can expect cost savings of up to 15%

- Implementation projects covering a wide range of applications and technologies have been or are being implemented in Austria - many more through UNIDO’s activities - sponsored by the Austrian Government

OECD - Conference
“Experiences and Perspectives of Service-oriented Strategies in the Chemicals Industry and Related Areas”
Vienna, 12/13 November 2003,

The conference concluded:

- “All these new service-oriented chemical business models require a close co-operation between the provider and the user of the chemical. Therefore, the potential of these business models has also to be seen in connection with the new EU Chemicals Policy (REACH), which will require a new relationship between provider and user and the conventional paradigm “supplier here - customer there” will hardly be crowned with commercial success.”
4 Key Questions

- Does REACH pave the way for Chemical Leasing - and what are the indications?
- Does Chemical Leasing pave the way for REACH - Implementation - and what are the indications?
- Do the experiences gained from pilot projects give any indication about possible synergies?
- Is there a way to provide assistance for companies willing to move into that direction?

REACH and Chemical Leasing share the same philosophy

- Mutually supportive in developing rules for „sharing“ (costs, responsibility, information)
- Chemical Leasing businesses involve different stages of the supply chain
- Chemical Leasing businesses are life cycle oriented
- Chemicals are handled with care (REACH: regulatory driven – Chemical Leasing: economically driven)
- Chemicals and their applications are monitored
REACH and *Chemical Leasing*

share the same philosophy II

- *Chemical Leasing* secures compliance with the **DUTY OF CARE**
  (mandated by REACH Recital. 16, Art 1 para 3)
- *Chemical Leasing* is the tool to demonstrate "adequate control"
  (REACH Para 60)
- *Chemical Leasing* is the ideal business environment to identify and
  apply the use and exposure category concept in particular within the
  Ch. Safety Report – jointly by suppliers and users.
- Application of *Chemical Leasing* implies measures for monitoring the
  quality/condition of the chemical, their applications and emissions –
  identical measures will be required by REACH (Art 14.6. for
  manufacturers; Art 37.5. Down Stream Users)

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REACH and *Chemical Leasing*

share the same philosophy III

REACH is going to mandate along the supply chain:

- Information exchange
- Monitoring procedures
- Patterns for Sharing and Co-operation
- Documentation and assessment procedures

Case studies result: Chemical Leasing is supportive to
REACH implementation.
REACH and Chemical Leasing -

Main Conclusion:

Chemical Leasing is making use of REACH structures and is turning them into economic advantages while at the same time catalysing REACH – compliance!

The issue of substitution

• Continuous optimisation in economic and also ecologic terms is an inherent and integrated element of the Chemical Leasing concept.

• Resources efficiency as well as Substitution of Very High Concern Chemicals therefore are a logical and natural result of the optimisation process within Chemical Leasing applications.

• The application of (certified) Chemical Leasing might thus even be a precondition for a use of such a substance to be authorized.
Synergies - Economic Experiences from Case Studies

- Combines Know How gained in product design and process design of manufacturer and applicant (Example: joint venture of manufacturer of furniture/paints)

- Enables business partners to offer solutions on the market which would otherwise remain on the research and development stage - boost in competitiveness (Example: Metal cleaning for car industry)

- The enhanced interlinkages as to know how-exchange establish long term co-operation along the supply chain (Example: Paint stripping for furniture industry)

Means to boost further synergies

Quality standards are being offered in order to:

- Provide a structure for setting up and running the business model
- Protect the business model to avoid „ecological abuse"
- Include a „REACH – compliance checked!“ chapter

Extending catalogue of case examples and their evaluation
Chemical Leasing opens a window of opportunity for turning:

• REACH - obligations
• REACH responsibilities and
• REACH flows of information

into successful business strategies.
Chemical Leasing Case Studies, Reinhard Joas

Chemical Leasing and outcomes of case studies

Basic principles of ChL
Traditionally, chemicals are sold to customers, who use them to fulfil certain functions. Their suppliers have a clear economic interest in increasing the amount of chemicals sold ("The more you sell, the more you earn"). Typically their earnings increase if they sell chemicals at higher prices or to larger amounts. Higher prices, however, are difficult to be achieved due to international competition. So a main focus is set on higher sales volumes. This is in many cases related to problematic releases to the environment and to negative consequence for the future availability of resources.

Chemical Leasing (ChL) inverts a supplier's commercial interest in higher consumption of chemicals. In a ChL business model the chemical supplier is paid for the service provided by the chemicals and not for the amount of chemicals provided. The chemical supplier becomes a service provider, and as such it is interested in keeping costs low while providing the service demanded to its customers. Reducing costs means reducing the consumption of chemicals which in a ChL business model has become an expense factor for the chemical supplier. Using its know-how regarding the substance, the chemical supplier will try to make the chemical application as efficient as possible. Efficiency may also result from an optimisation of the production process, adjusted to the specific chemical.

Case studies, involved players and their benefits
Several case studies have been successfully executed within the framework of UNIDO projects (e.g. use of powder coatings for coating of electrical equipment; use of solvents within painting of cars; lubrication in sugar mills). In all case studies, the result is a win-win-situation: There are economic benefits for the partners and there are environmental advantages due to reduced chemicals consumption.

The main players within the ChL models are typically the producer (supplier) of the chemicals and the user of the chemicals. The unit of payment is of high importance in Chemical Leasing. In contrast to traditional business models the basis of payment is not the amount of the chemical used (e.g. in $ per ton) but functional units like "m² coated surface".

Further advantages of ChL
ChL is additionally advantageous for chemical suppliers since they will be able to strengthen customer relationships. For customers on the other hand it is advantageous to concentrate on their core business and to cede responsibility for the management of chemicals. In addition sometimes the advantages of common Research&Development activities can be realised. Also, ChL has obvious environmental advantages. Process optimisation not only leads to a reduced chemical consumption but very often also to a reduction in the consumption of other resources like energy or water. As a result the waste load as well as air and water pollution will decrease, reducing the total environmental impact of the production process.

Presentation by:
Reinhard JOAS
CEO, BiPRO GmbH - Beratungsgesellschaft für integrierte Problemlösungen
Chemical Leasing and outcomes of case studies

Dr. Reinhard Joas
6th March 2008
Balatonfüred

BiPRO
Beratungsgesellschaft für integrierte Problemlösungen

Objectives and Approach of Chemical Leasing

What is it:
Chemical Leasing is a service oriented business model

Players:
- producers of chemicals
- users of chemicals
- equipment supplier
- recycling companies
- authorities / int. institutions

Objectives:
Environment:
- Emission reduction
- waste load
- water pollution
- air pollution

Economy:
- added value
- Costs producers of chemicals
- Costs users
- Costs others

Principle:
Chemical Leasing suggests new forms of payments for chemicals that direct the economic interests of all partners towards process optimisation and reduction of chemicals consumption.
Payments on the benefits of chemicals

Chemical producer provides chemicals to the user (no sales)

Payment not for the chemical itself, but for the benefits of the chemical (e.g., not for t of solvents used, but for number of tubes cleaned!)

Amount of chemicals used will decline as chemicals volume turns from a factor for earnings (“the more you sell the more you earn”) to a cost driver (“less is more”).

How to realise the added value: example

User needs cleaning of 2 million tubes

Chemical producer
With classical business

- 100 t solvents sold = 100,000 $ turn over
- 100 t production = 80,000 $ var. costs
- = 10,000 $ fix costs

Result: 10,000 $ net profit

Added value from process optimisation

Chemical producer
With Chemical leasing

- Added value from process optimisation
- Only 60 t solvents needed
- Leasing rate 0,04$ per tube

Leasing income = 80,000 $ turn over

- 60 t production = 48,000 $ var. costs
- = 10,000 $ fix costs

Result: 22,000 $ net profit

Added Value for the chemical producer: 12,000 $ net profit
How to realise the added value: example

User needs cleaning of 2 million tubes

Chemical user
With classical business

Chemical user
With Chemical leasing

Costs to buy 100 t solvents = 100,000 $

Costs for leasing of 60 t solvents = 80,000 $

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Added Value for the chemical user: 20,000 $

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Service oriented business strategies: Basic ideas

user of a chemical

Does not pay to own a chemical, but spends money for the benefits provided by a chemical

producer of a chemical

Sells the function of a chemical, including know how on efficiency and risks, adding services like production management, logistics and process optimisation
Service oriented business strategies: Basic ideas

- Amount of produced chemicals will decline as chemicals volume turns from a factor for earnings ("the more you sell the more you earn") to a cost driver ("less is more")
- Added value can be shared among the involved partners

Chemical leasing business models bundle motivations

Traditional business models: Contradictory motivations

- Material (costs, volume): "the more the better" vs. "less is more"

Chemical leasing models: Bundled motivations

- Material, work, waste management: "less is more"
CASE study: use of powder coatings for coating of electrical equipment

Classical business model: payment per t of powder coating

Chemical leasing: payment per m² of coated surface

CASE study: use solvents within painting of cars

Classical business model: payment per t of solvents

Chemical leasing: payment per car painted
CASE study: lubrication in sugar mills

Classical business model: payment per t of lubricants

Chemical leasing: payment per t of produced sugar or t of handled sugar cane

CASE study: water treatment

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

Chemical leasing: payment per m³ of purified water
CASE study: paint application

Classical business concept: payment per kg of paint

Chemical leasing concept: payment per m² painted surface or payment per number of painted pieces

CASE study: optimisation of glues for labelling

Classical business model: payment per kg of glue

Chemical leasing: payment per labelled bottle
CASE study: optimisation of foams for caps

Classical business model: payment per kg of foam

Chemical leasing: payment per cap

CASE study: optimisation of solvents for printing of sheets for tin production

Classical business model: payment per kg of solvents

Chemical leasing: payment per printed sheet
Experience 1

Integrate ChL in marketing and network development strategies:

Company choices

STEP 1
select appropriate partners for chemical leasing
(strategic decision)

STEP 2
establish a successful business model in one country and for one type of benefits

STEP 3
adapt business model for further clients
adapt business model for further countries
adapt business model for further products
Experience 2
Suppliers of equipment/machinery might be interesting further partners

- Individual efforts to realise potentials of chemicals is often difficult
- Chances of chemical leasing
  - Better use of existing know-how
  - More efficient research and development
  - Balance with respect to access to the client
- Optimisation potentials of chemicals and machinery

Experience 3
Recycling companies often strengthen a Chemical Leasing concept

- Ecological benefits of a recycling concept
- It is not the intention of chemical leasing to find an exclusion of waste law
Experience 4

Take care of know how protection and don’t neglect internal communication!

⇒ Communicate the business model to your staff. In many cases they are afraid to give away their competence and to lose their job (what is neither the intention nor the consequence of chemical leasing concepts).

⇒ Establish clear contracts with your partners on intellectual property rights. Try to find a good balance between necessary protections and communication of know-how.

Experience 5

Don't stick too close to chemicals! Use synergies between internal and external Chemical Leasing!

STEP 2: synergy to optimise production processes

STEP 1: external activity

Users in several branches

Producer of chemicals

ChL

producer of abrasives
Experience 6
Chemical Leasing can be an opportunity for joint research activities

Producer of chemicals
Supplier of plants
User
Other partners

network of know how

➢ better products and technologies
➢ new concepts
➢ environmental advantages
➢ sustainable development

Need for co-operation defines chances and obstacles

Producer of chemicals
Supplier of plants
User
Other partners
Recycling company

network

chances:
➢ better products and technologies
➢ combined know-how as a specific resource
➢ environmental advantages
➢ sustainable development

obstacles:
✔ cost of business reorganisation
✔ confidentiality
✔ establishment of quality standards
✔ finding ways of fair allocation of benefits
Chemical leasing concepts are no „self running“ processes! An initiator and some „catalysts“ are necessary to start the „reaction“

Problems to be solved:
→ Find right partners
→ Confidence between partners
→ Quality assurance
→ Fair contracts that meet expectations

Conclusions
1. Chemical Leasing is a new approach for a win-win situation for economy and environment
2. First pilot projects in Austria, Mexico, Egypt and Russia proof applicability and potentials of the model
3. An open multi stakeholders working group helps to exchange experiences and solve principal problems
4. Chemical Leasing can also be used as a policy tool for know how transfer, risk reduction and environmental objectives of risk reduction. In this function it should be supported by the international community
REACH, Gyula Körtvésyessy

REACH – a shift of paradigm and its consequences for stakeholders in Central Eastern Europe

Hungary – very similarly to other countries joining the EU in 2004 and 2007 – has his own but very short history for chemical safety. Hungary adopted the first Governmental Decree on the subject only in the nineties. The first Act called Chemical Safety Act was issued on 2000 together many connected Decrees. Even though each was based on 67/548 and other EC directive as adopted, there was much dissimilarity mainly because Hungary was not a member of the EU yet. Therefore, the system was centralized based on a new institution, the National Center of Public Health, named Fodor József. Even now, there are four authorities enforcing chemical safety regulations in Hungary which makes life difficult for companies. On the other hand, control of the chemical safety has been formal partly because of the authorities, partly because of the very bad quality of SDSs at companies, independently from the suppliers (eastern or western companies alike).

Because REACH, the new regulation of Europe for chemical safety was adopted at the same period when CEE countries joined EU, they were very active in the process. Not only authorities, but association, societies, ministries, companies, NGOs took part in the long debate reaching to REACH. This deep involvement resulted in the well-know and highly appreciated OSOR principle, the British-Hungarian amendment idea for One Substance One Registration.

In the past, not only the quality of the SDS received was obsolete, but users could receive very limited technical information of how to use chemicals environmental friendly. CEE countries should purchase large parts of chemicals they needed from western companies.

One of the main aims of REACH is to push manufacturers of chemicals to inform users about the safe use of chemicals. It is less comprehensive than the aim of Chemical leasing but REACH is a legal tool which definitely will increase the involvement of the manufacturers to consider the whole life cycle of their chemicals. Instead of simple transferring the products to the customers, REACH requires manufacturers to collect information about all uses of the chemicals on their own, in preparations and even in articles, and to give – legally more binding - advices about their safe use in the new attachment to safety data sheet, the exposure scenario. This new exchange of information between manufacturers and users must help in introducing the business model of Chemical leasing. If this model can decrease the amount of chemicals used it means not only less human health and environmental impact, but also a preferred option in REACH regulation. However, two problems should be considered: leasing chemicals into the EU or recovering chemicals inside the EU are both equal to manufacturing them even though wastes are outside the scope of REACH. But in both cases, registration, authorization and notification requirements should be applied.

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Presentation by:

Gyula KÖRTVÉLYESSY
Honorary Secretary General
Hungarian Chemical Society
REACH – a shift of paradigm and its consequences for stakeholders in Central Eastern Europe

Dr. Gyula Körtvélyessy
Honorary Secretary General
Hungarian Chemical Society

Stakeholders in Hungary

• Industry: deeply involved ⇔ what is it all about?
  – Chemical industry ⇔ processing industry
• Federations (MAVESZ: Hungarian Chemical Manufacturers Association), Society (MKE: Hungarian Chemical Society): very active
• Trade unions: actively involved
• Owners (shareholders):
  – Pushing to gain compliance
  – Import problems for companies (Japan, USA)
• Authorities:
  – ANTSZ: National Public Health and Medical Officer Service
  – OKBI: National Institute of Chemical Safety
  – Fodor József National Center for Public Health
  – OMMF Hungarian Labour Inspectorate
  – OKTVF National Inspectorate for Environment, Nature and Water
  – OKF The National Directorate General for Disaster Management, Ministry of the Interior
• NGOs
History of Chemical Safety in HU

- Nineties: first decrees on poisons
- 2000: New Act, XXV.
  - based on EC directives and regulations
  - Some similarities to REACH
    - Reporting EINECS substances but without tests (to Nat.Auth.)
  - Some dissimilarities to REACH
    - Reporting preparations
    - Attaching SDS for acceptance
- 2007
  - In June a new decree: first reference to REACH for SDS
- 2008
  - Updating Act XXV: everything remains the same

Present practice in chemical safety

- Possible information attached to chemical products
  - Safety: SDS
  - Quality: specification and/or test report and/or conformance certificate
  - Use: Technical data sheet
    - instruction of use
    - Training on the spot
- Main points for authorities: SDS and labeling
  - Is there any?
  - Language?
  - Where?
  - Is there any reference to Hungarian law?
  - Are there enough chapters?
Specification

Additive

<table>
<thead>
<tr>
<th>Test parameter</th>
<th>Specification</th>
</tr>
</thead>
<tbody>
<tr>
<td>Phosphoric Acid</td>
<td>75 %</td>
</tr>
<tr>
<td>Copper, as Cu 3</td>
<td>3 %</td>
</tr>
<tr>
<td>Appearance</td>
<td>Liquid</td>
</tr>
<tr>
<td>Colour</td>
<td>Clear, dark - blue</td>
</tr>
<tr>
<td>Odour</td>
<td>No odor</td>
</tr>
<tr>
<td>Boiling point range</td>
<td>135 °C - 158 °C</td>
</tr>
<tr>
<td>Freezing point</td>
<td>-17,5 °C</td>
</tr>
<tr>
<td>PH</td>
<td>1-1.5</td>
</tr>
<tr>
<td>Specific Gravity</td>
<td>1,6 at 25°C/15.5°C</td>
</tr>
</tbody>
</table>

IP CONDITIONER is a highly effective liquid non-chromated anodizing aid or aluminum prior to Bright Dip. NOVA BRIGHT DIP CONDITIONER is designed for specific applications and produces smut free surface ready for Bright Dip.

ACTERISTICS:

IP CONDITIONER is strongly acidic. Contact with the skin or eyes may cause irritation or burns. The same safety precautions should be observed as for other acidic products. Personnel should wear eye protection, NIOSH approved respirators, protective gloves and apron or other protective clothing when working with IP CONDITIONER. Tanks used for NOVA BRIGHT DIP CONDITIONER should be fitted with adequate exhaust system to protect workers against irritating or noxious emissions. Material Safety Data Sheets are available upon request from the manufacturer.

COMMENDATIONS:

All equipment for NOVA BRIGHT DIP CONDITIONER should be corrosion-resistant. Stainless steel, rigid polyethylene, polypropylene or polyethylene lined steel tanks. Racks and other related equipment should be made from corrosion-resistant materials. The rinse tank following the NOVA BRIGHT DIP CONDITIONER tank should be made of the same material as the NOVA BRIGHT DIP CONDITIONER tank.
Hungarian chemical industry in the EU

Comparison of structures

EU

HU

Source: CEFIC-MAVESZ
Import from non-EU countries

2003

- Indonesia
- India
- Ukraine
- Belarusia
- Romania
- China
- Japan
- Switzerland
- Russia
- USA

Source: RUEMA 2003

What is REACH all about?
Chemicals in processing industry

Nature

Separation
Chemical
reactions

Basic
materials

Chemical
reactions

Active ingredients

Preparations

Equipment

Parts

Connections between chapters in REACH

Substances

Uses:
On their own, in preparations, in articles

Applications for Authorization

Evaluation

Registration

Substances for Authorization (Use)
Annex XIV.

Classification list

Substances for Restriction
(Uses): Annex XVII.
Possible Movements of Products

Non-EU | EU
---|---

EU company

Chemical Leasing and REACH

- Two main questions → operation models of CL
  - Who owns the chemicals?
    - If supplier (as in all cases): supplier is responsible for any REACH compliance
      - Clear statements are needed in the service contract
    - If user (as in sales models):
      - Supplier remains responsible for safe use
      - User shall follow instructions (in SDS)
  - Where does the operation take place?
    - If in the EU ⇨ clear situation
    - If crossing EU border ⇨ Import = manufacture
Principle for Risk Assessment

- Phys-Chem. Tox. Ecotox. Tests results
- Substance
- Derived No Effect Level DNEL
- Predicted no Effect Concentration PNEC
- Human exposure
- Concentration in air
- Environmental exposure

Information along the supply chain

- Dangerous + PB
- M/I SDS + ES 2010-13-18
- Dangerous + PB >10 t/yr
- Chemical Saf. Assessment
Exposure scenario ES

- Part of the chemical safety assessment CSA
  - For dangerous, PBT, vPvB chemicals and substances on the potential list
  - >10 t/year manufacture or import
- For each identified use of each customer
- If user does not meet the conditions in ES he
  - Shall prepare his own CSA
  - Report the case to the Agency
  - Shall stop using chemicals

---

### Preliminary example of exposure scenario to annex to the SDS NicaPaint (a decorative paint)

<table>
<thead>
<tr>
<th>1. Short title of Exposure Scenario</th>
<th>General public domain (91222) Coatings and Paints, Fillers, Putties, Thickeners (PCD) Roller application or brushing of adhesive and other coating professional (PROC10)</th>
</tr>
</thead>
<tbody>
<tr>
<td>2. Description of activities/processes covered in the Exposure Scenario</td>
<td>Preparation of paint: stirring of the paint, possibly addition of water and Manual application of paint in-doors with brush or roller Cleaning of the equipment by rinsing water</td>
</tr>
<tr>
<td>Operational Conditions</td>
<td>Workers (professional) 8 hrs/day, 5 workdays/week Customers Product is not intended for consumer use Environment Up to 385 days per year</td>
</tr>
<tr>
<td>Physical form of substance or preparation</td>
<td>The product is a liquid. It does not form aerosols on application.</td>
</tr>
</tbody>
</table>
| Concentration of substance in preparation or article | Concentrations of classified substances in supplied formulation are:
  - E (solvent): 10%
  - F (solvent): 2%
  - G (solvent): 0.5% |
| Amount used per time or per activity for which the RMsEs, in combination with other occupational conditions of use ensure control of risk | Workers (professional) 8 hrs/day Customers Product is not intended for consumer use Environment |
| Other Operational Conditions determining exposure | Worker (professional) Temperature: room temperature, i.e. 20°C (relevant for inhalation). May however vary between 10 and 30°C Customers Product is not intended for consumer use Environment Emission factor to waste water: 10%
  If waste water is not discharged via public sewer system, then the capacity of the receiving environment should be at least 12 m³/d. |
Waste in REACH

- Wastes are not substances, preparations and articles
- Waste are NOT exempted from REACH
  - Registration shall cover the whole life cycle of chemicals incl. waste phase
    - Get to know the amount of waste of substances
    - Shall evaluate waste phase in chemical safety report
  - SDS shall cover waste phase
    - Not „according to the local regulations”
    - PNEC Predicted no effect concentration
    - Environmental control measure
Recovery in REACH

- Very important activity in CL
- Company which recovers a product shall register any substance in the product except
  - If the substance has been registered
  - And the recovered substance is the same as the substance that has been registered

Exemption: if substance has been registered

Comp. A: manufactures toluene
Comp. B: recovers toluene

Comp.A  Pre-registration  Registration

Comp.B  Pre-registration  Noncompliance!!  Registration

Involvement of CEECs in REACH

- Started in 2002, Chemleg-Chemfed program
- Covered Chemical Manufacturer Federations in CEECs
- Active lobbying for CEEC SMEs: OSOR
- Trainings, books, papers
- Webpage: www.reachcentrum.hu
- www.kortvelyessy.hu

Thank you for your kind attention!
Cleaner Production and Chemical Leasing, Petra Schwager

Cleaner Production and Chemical Leasing: a win-win approach

To address the challenges of the new global context and to enhance economy wide productivity in a sustainable manner, the United Nations Industrial Development Organization (UNIDO) focuses its activities on three thematic priorities: poverty reduction through productive activities, trade capacity building and environment and energy.

The organization's worldwide Cleaner Production Programme is an important tool to bridge these three priorities and plays a fundamental role in promoting sustainable industrial development and sound chemicals management in developing countries and countries with economies in transition.

A critical element of Cleaner Production is that it results in a "win-win" scenario for industry and the environment as it implies striving for continuous resource efficiency to create economic savings for the company. In this way it enhances the competitiveness of industry, promoting sustained social advancement in a way which is compatible with environmental protection. In 2002 UNIDO launched the holistic CP approach that emphasizes the company and sectoral level and takes into account the whole product cycle.

The concept of Chemical Leasing is based on the preventive idea of Cleaner Production. It is a shift from the traditional business concept that focuses on a constant increase in sales volume towards a more service and value-added approach. Chemical Leasing business models provide concrete solutions to the effective management of chemicals and to negative releases to the environment.

These approaches have been implemented in Egypt, Mexico and the Russian Federation in close cooperation with the respective National Cleaner Production Centres. The key elements of successful Chemical Leasing implementation involve process optimization as a consequence of more intensive cooperation of supplier and users of chemicals, enhanced environmentally sound technology development and transfer, greening of the supply chain and capacity building, and clearly result in sound chemicals management at plant level.

Combining Cleaner Production and Chemical Leasing has proven to be a win-win approach for the economy and the environment with synergetic potential for energy savings, continuous process optimization, future-oriented solutions and long-lasting cooperations.

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Presentation by:

Petra SCHWAGER

Industrial Development Officer, Cleaner Production Programme

UNIDO
Cleaner Production and Chemical Leasing – a win-win approach

Petra Schwager
March 6, 2008, Balatonfüred

Elements of the presentation

• UNIDO and its global Cleaner Production Programme (CPC)
• Chemical Leasing and synergies with CP
• Experiences in applying Chemical Leasing and CP at plant level
• Lessons learnt
UNIDO Background

UNIDO was set up in 1966 and became a specialized agency of the United Nations in 1985. As part of the United Nations common system, UNIDO has responsibility for promoting sustainable industrial development throughout the developing world, in cooperation with its 171 Member States. Its headquarters are in Vienna, and it is represented in 35 developing countries.

UNIDO Vision

To improve the living conditions of people and promote global prosperity through offering tailor-made solutions for the sustainable industrial development of developing countries and countries with economies in transition.
Cleaner and Sustainable Industrial Development

Productivity Enhancement for Social Advance

Competitive Economy

Productive Employment

Sound Environment

Definition of Cleaner Production

Cleaner Production is the continuous application of an integrated and preventive environmental strategy to products, processes and services to increase overall efficiency and reduce risks to humans and the environment. This includes the efficient use of raw materials, water and energy to allow cost reduction and productivity increase for industry, resulting in a win-win situation in economic and environmental terms.
UNIDO’s Worldwide CP Programme

Since 1994: In close cooperation with UNEP, establishment and management of National Cleaner Production Centres (NCPCs) and Programmes (NCPs) in 38 countries.

The aim is to enhance the competitiveness and productivity of industry, especially SMEs in a way compatible with environmental protection.
National Cleaner Production Centres and Programmes

Set up with the support of existing local institutions to deliver:

- Awareness-raising on the benefits of CP
- Training of experts on CP and related issues
- Technical assistance to companies
- Assistance in development of CP and EST (Environmentally Sound Technology) investment projects
- Policy advice to national and local governments

UNIDO’s Holistic CP Approach

**Cleaner Production**

Applied to the entire production and service cycle

At sectoral level

- **Products**
  - Reduction of waste through better design
  - Use of waste for new products

- **Processes**
  - Conservation of raw material, energy, water
  - Reduction emissions at source
  - Evaluation of technology options
  - Reduction of costs and risks

- **Services**
  - Efficient environmental management in design and delivery

At company level

**Impact**

- Improved efficiency
- Better environmental performance
- Increased competitive advantage
A Service-Oriented Business Model

- Closing-the-loops in selected industrial sectors
- Change in the relation between manufacturer and user, where manufacturers shift from selling products to supplying services
- Win-win situation for the economy and the environment

Cleaner Production and Chemical Leasing

Cleaner Production ⇒ efficient use of resources (water, energy, raw materials) to allow cost reduction and productivity increase

Chemical Leasing combined with Cleaner Production further increases environmental and economic benefits and continuous improvement through the active involvement of additional stakeholders of the production/supply chain
Benefits of combining CP and ChL

- Energy savings and continuous process optimisation (CP → CP+) due to additional know-how of chemical suppliers
- Easier access to additional CP technologies and investments due to co-operations
- Future-oriented solutions due to improved research and development and long-lasting co-operations

ChL Case Study
Cleaning with Hydrocarbon Solvent

Supplier: Dr Badawi Chemical Work
User: GM Egypt
Industrial process: Cleaning of equipment with solvent
Chemicals: Hydrocarbon Solvent
ChL Case Study

Before Chemical Leasing

Dr Badawi sells tons of hydrocarbon solvent for cleaning to GM Egypt for EGP/Liter with a minimised responsibility

- Solvent waste is a common problem in the automotive sector in Egypt
- Current practice is disposal of solvent waste (hazardous) in non-sanitary dumpsters
- High price of raw material (high petroleum price)
- 70-80% of solvent waste is considered as raw material
- More consumption leads to more VOCs in the workplace
- High disposal costs for solvent waste

ChL Case Study

Under Chemical Leasing

Dr Badawi sells to GM Egypt the service of cleaning with hydrocarbon solvent against a fixed fee-per-vehicle with defined responsibilities in a ChL contract between GM Egypt, Dr Badawi and the ENCPC

- Six months monitoring phase (fixation of price per vehicle)
- Chemical Leasing contract for three years
- Recycling of solvent waste at Dr Badawi facility (Recycling Unit)
ChL Case Study
Economic Benefits

- Cost reduction by 15% (saving of raw material with recycling)
- Reduction of solvent consumption from 1.5 L/vehicle to 1 L/vehicle which leads to significant reduction in VOCs
- Shared liability and benefits
- Long-term business relationship based on long-term contract

ChL Case Study
Environmental Benefits

- Recycling of solvent waste instead of disposal (Closing the Loop)
- Better hazardous waste management in accordance with environmental regulations and international environmental corporate policy
ChL Case Study
Organizational and Management Benefits

- Higher efficiency in cleaning process with hydrocarbon solvent by applying batch cleaning
- Use of hydrocarbon solvent solely for the purposes of cleaning of equipment (rather than e.g. for washing worker hands, cloths etc)
- Capacity building and high awareness of operation staff

Case Study
Synergies of ChL and CP

Starting point: Change chemical business to Chemical Leasing
Supplier sells more than 100,000 small plastic containers with organic per-oxides
User produces polymers and needs per-oxides as starters of the reaction

Non optimised process due to non optimised collaboration

Hazardous waste: 100,000 plastic containers
Waste water form cleaning of containers
huge costs for handling, cleaning, disposal
Non optimised production process due to delivery of chemicals
Case Study
Synergies of ChL and CP

Basic idea: supplier is paid on the basis of produced polymers and is required to provide proper per-oxides → process optimisation

→ Cleaner production – approach realised

• (nearly) no waste
• no waste water
• optimised and stable production process

But: partners could not agree on a changed unit of payments

Demonstration project in Egypt

<table>
<thead>
<tr>
<th>Industry sectors</th>
<th>Chemicals</th>
</tr>
</thead>
<tbody>
<tr>
<td>Manufacture of electronic equipment</td>
<td>Powder coating</td>
</tr>
<tr>
<td>Car manufacture</td>
<td>Solvents</td>
</tr>
<tr>
<td>Steel industry</td>
<td>Galvanizing agents</td>
</tr>
<tr>
<td>Manufacture of caps and cans</td>
<td>Solvents</td>
</tr>
<tr>
<td>Manufacture of refrigerators and washing machines</td>
<td>Phosphatating agent</td>
</tr>
<tr>
<td>Textile industry</td>
<td>Textile chemicals</td>
</tr>
<tr>
<td>Brewery</td>
<td>Glues for labelling</td>
</tr>
</tbody>
</table>
Demonstration projects in Mexico and Russia

<table>
<thead>
<tr>
<th>Industry sector</th>
<th>Chemicals</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Mexico</strong></td>
<td></td>
</tr>
<tr>
<td>Sugar mill</td>
<td>Lubricants, biocides, process chemicals</td>
</tr>
<tr>
<td>Electro plating industry</td>
<td>brightener</td>
</tr>
<tr>
<td>Petrochemical industry</td>
<td>catalysts</td>
</tr>
<tr>
<td>Food industry</td>
<td>Process chemicals</td>
</tr>
<tr>
<td><strong>Russia</strong></td>
<td></td>
</tr>
<tr>
<td>Glue production</td>
<td>Waste water treatment chemicals</td>
</tr>
<tr>
<td>Disposal site</td>
<td>Waste water treatment chemicals</td>
</tr>
<tr>
<td>Surface treatment</td>
<td>Solvents</td>
</tr>
</tbody>
</table>

Lessons learnt

- Concept sells easily but implementation takes time
- ChL is a new approach for a win-win situation for economy and environment, key issue is the definition of the unit of payment
- An open multi-stakeholders working group helps to exchange experiences and solve problems
Lessons learnt

- Intensive involvement of NCPCs is necessary to ensure proper implementation and monitoring
- Trust and willingness for cooperation of the partners is essential
- Mediation and moderation of NCPCs for resolving conflicts is often required
- Mutual benefits between ChL and CP; ChL enhances the impact of CP

Thank you for your attention

Petra Schwager
UNIDO- Cleaner Production Unit
www.unido.org/cp
Email: p.schwager@unido.org
APPENDIX II – PRESENTATION WORKGROUP 1

Getting Fit For REACH
Applying Chemical Leasing

Experiences of Dow/SAFECHEM

Dr. Hans-Norbert Adams, Dr. Markus Frank
Balatonfüred, March 6, 2008

The REACH regulation should ensure a high level of protection of human health and the environment as well as the free movement of substances, on their own, in preparations and in articles, while enhancing competitiveness and innovation.

A high level of human health and environmental protection should be ensured in the approximation of legislation on substances, with the goal of achieving sustainable development.
REACH

- Is a new single regulatory system for chemicals management in the European Union (EU), in force since 1. June, 2007

- Objective is to ensure the safe use of chemicals providing a high level of protection of human health & the environment whilst improving innovation and enhancing the competitiveness of the European industry.

- Puts responsibility on all members of the value chain to
  - enhance the protection of human health and the environment,
  - increase the knowledge base on
    - Hazards
    - Uses and
    - Risks of chemical substances

REACH and Dow’s 2015 goals

- The REACH objectives are fully aligned to Dow’s commitment to sustainability and Dow’s 2015 goals.
Dow’s 2015 Sustainability Goals

- Dow's commitment to Sustainable Chemistry:
  "We will innovate to improve confidence that our products are managed safely throughout their lifecycle and develop products that will make a lasting, positive improvement on the world."

- 2015 Product Safety Commitment:
  "By 2015, Dow will make publicly accessible safety assessments for its products globally, and in doing so will address relevant gaps in hazard and exposure information. It will continue to take appropriate action based on the assessments to protect human health and the environment throughout the life cycle."

Sustainability – Surface Cleaning

Achieving the goal of sustainability means for surface cleaning

- Use the best available technology and the most effective chemicals for a certain application in terms of
  - energy consumption
  - raw material consumption
  - material life cycle prolongation
  - material recycling
  - toxic emissions into air, water and soil
  - potential misuse
- Control the entire life cycle of a product
- Manage the risk of a product
- Develop a win-win situation with our customers to create economic value
Chemical Leasing

Example – Surface Cleaning

Best Available Technology

Solvent Services - SAFECHEM
- Designed solvents to achieve best cleaning results whilst offering the capability for recycling
- Closed-loop SAFE-TAINER™ system for effective risk management of solvent
- Life cycle management by cooperation in a Service Alliance with Dow, Distributors, OEM and waste managers
- Reduction of solvent use (extended solvent life cycle) by solvents services
- Optimisation of cleaning process through consulting

Cleaning machines
- Hermetically sealed cleaning machine with internal recycling of solvents
- Know-how about cleaning process
- Maintenance and problem solving

Cooperation

SAFECHEM - Pioneer in Chemical Product Services
- Closed-loop system for effective risk management

Chemical Leasing – Pilot Project

Example – Surface Cleaning

Highly efficient Solvent & Solvent Services

SAFECHEM

- Enhanced Know-how pooling for optimised process
- Cleans customer’s parts
- Provides specified cleaning quality

Price function of
- cleaned basket or piece
- cleaning capacity

High performance cleaning machines & related services

LEASING FEE

TESMA MOTOREN- UND GETRIEBE-TECHNIK GMBH

Project based financial + administrative support
Chemical Product Services - a Paradigm Shift

Revenue

Chemical Product Services (CPS) for optimization of performance efficiency

Chemical Product

Time

More material focused

More performance efficiency focused

Sustainability

CPS – Maximising Environmental Benefits

Open machine

Solvent
764 kg

Air emissions
520 kg

Wastes
233 kg

Regulatory induced

Closed machine

Solvent
160 kg

Air emissions
10 kg

Wastes
150 kg

Business model change

Closed machine & Chemical Product Services

Solvent
15 kg

Air emissions
10 kg

Wastes
5.3 kg
Austrian Pilot – Results & Experiences

Results are encouraging …

- **Economic feasibility:**
  - Shift in value generation is possible

- **Environmental benefit:**
  - Solvent life extension by factor 4 to 8

- **Knowledge pooling:**
  - Product efficiency optimization through cooperation with OEM

- **Customer benefit:**
  - Profits from the best cleaning solution for his needs

- **Adequate Risk Control:**
  - Hermetically sealed machines and close loop solvent handling

  … when boundary conditions are met

---

Adequate Risk Management

CPS/Chemical Leasing business models achieve overall risk reduction in surface cleaning

- Enable minimize chemical consumption, minimized exposure and emissions

- Enable simple, direct and transparent information flow to assure safe use

- Enhance product stewardship responsibility over chemical’s product lifecycle.
### Advantages for REACH compliance

<table>
<thead>
<tr>
<th>REACH Requirement</th>
<th>Responsibility</th>
<th>Advantage Chem. Leasing</th>
</tr>
</thead>
<tbody>
<tr>
<td>Hazard knowledge</td>
<td>To be established by Producer.</td>
<td>• Simplified building of ES, CSA and CSR.</td>
</tr>
<tr>
<td>Use and exposure data</td>
<td>Best known by Downstream User (DU). DU needs to communicate details if data</td>
<td>Since Hazard knowledge &amp; use and exposure knowledge combined in one hand (licensed)</td>
</tr>
<tr>
<td></td>
<td>needed for ES and CSA unknown to Producer.</td>
<td></td>
</tr>
<tr>
<td>Exposure Scenario (ES)</td>
<td>• To be established by producer.</td>
<td>• DU is assured that his use is properly covered</td>
</tr>
<tr>
<td>Chem. Safety Assessment (CSA)</td>
<td>• To be checked by DU if ES covers use.</td>
<td></td>
</tr>
<tr>
<td>Chem. Safety Report (CSR)</td>
<td>• Own CSA/CSR by DU if producer not covering his use</td>
<td>• Minimum REACH knowledge and REACH admin. efforts required from DU</td>
</tr>
<tr>
<td>communication of conditions for</td>
<td>Producer. He has to communicate in e-SDS. Changes in DU process require DU to</td>
<td></td>
</tr>
<tr>
<td>Safe use down the supply chain</td>
<td>assess if ES, CSR communicated in e-SDS still valid</td>
<td></td>
</tr>
</tbody>
</table>

**Chemical Leasing: Excellent fit with REACH requirements**

---

### Extended sustainability focus

**High Sustainability level**

- Chemical Leasing (where applicable)
  - Allows easy compliance with REACH
    - Excellent knowledge about all risk determining parameters
  - Extended sustainability focus compared to REACH
    - Adds additional sustainability criteria not in focus of REACH
      (like resource conservation, energy reduction, etc.)

- High level of protection of human health & the environment through adequate control of risks

**REACH**

- Sets the regulatory Chemical Management frame
  - Extended Hazards knowledge
  - Specific use based Risk Assessment
  - Communication of Risk management measures
  - Regulates use of specific substances of very high concern
Thank you for your attention!
UNIDO Conference

“Getting fit for Reach”

Balatonfüred, Hungary
6 – 7th March 2008

Chemical Leasing:
Experiences and expectations

Mark Reekie
Business Service Manager – Europe
Akzo Nobel Powder Coatings
Points to cover:

1. Who are Akzo Nobel Powder Coatings?
2. What are our experiences of Chemical Leasing?
3. What are our expectations for the future?

Who are Akzo Nobel Powder Coatings?
### AKZO NOBEL

|                | 2006  | 2005 | %  
|----------------|-------|------|-----
| Revenues       | 13,737| 13,000| 6   
| Operating income | 1,462 | 1,486 |     
| Net income     | 1,153 | 961  | 20  
| Number of employees (year end) | 61,880 | 61,340 |     

### AKZO NOBEL

**Pharma**
- 3 Business Units:
  - ORGANON
  - INTERVET
  - NOBILON

**Chemicals**
- 7 Business Units
  - PULP & PAPER CHEMICALS
  - FUNCTIONAL CHEMICALS
  - SURFACE CHEMISTRY
  - POLYMER CHEMICALS
  - BASE CHEMICALS
  - SALT
  - ENERGY

**Coatings**
- 5 Business Units
  - POWDER COATINGS
  - DECORATIVE COATINGS
  - INDUSTRIAL FINISHES
  - MARINE & PROTECTIVE COATINGS
  - CAR REFinishes
DECORATIVE COATINGS

- Major force in home improvement
- Products used by professionals and do-it-yourself enthusiasts
- Produces international brands (e.g. Sikkens®, Sadolin®, Levis®), as regional favourites (e.g. Crown®, Flexa®, Trimetal®, Nordsjo®, Herbol®)

INDUSTRIAL FINISHES

- Leaders in wood and coil coatings; important position in speciality plastic coatings and adhesives
- Wood coatings used on flooring and furniture, oil coatings on domestic appliances and metal building products
- Speciality plastics on e.g. consumer electronics and cosmetic packaging
- Adhesives and resin systems used by the woodworking industry for furniture, panels, parquet flooring and laminated beams
MARINE & PROTECTIVE COATINGS

- Market leaders in paints, antifouling and foul-release coatings for ships and yachts with the international® brand

- Protective Coatings for high value infrastructure, oil and chemical processing industry, and for airlines and aircraft manufacturers

- Makes products that offer reduced environmental impact

CAR REFINISHES

- One of the world’s leading suppliers of paint, services and software for the car repair, commercial vehicles and transportation markets

- Innovators in product and color technology and state – of- the – art customer service

- Manufacturers of the global brands Sikkens® and Lesonal®

- Top player in coating solutions for interior and exterior automotive plastic components
POWDER COATINGS

- Largest global manufacturer of Powder Coatings and world leader in Powder Coatings
- Two global brands, Interpon® for the architectural, automotive, domestic appliance, industrial, IT, furniture and general trade coater segments, and Resicoat® for functional markets
- Producer of non-stick coatings for use on cookware and industrial equipment

SIGNIFICANT EVENTS FOR POWDER IN RECENT COMPANY HISTORY

- 1998: Courtaulds Acquisition
- 2002: Ferro N.America/Asia Powder Coatings
- 2005: Coatech - Egypt
- 2006: balakom - Czech Republic
- 2007: New Plant Russia
- 2008: Akzo Nobel
ARCHITECTURAL

➢ Colours and finishes to suit every setting

➢ Durability to suit every climate

➢ Anti-corrosion primers

➢ Textured and smooth, gloss and matt

AUTOMOTIVE

➢ Electrocoat and liquid coatings to support some market segments

➢ Manufacturing sites throughout the world

➢ Technical centers of expertise and certified testing laboratories

➢ Local experienced sales and technical service support

➢ Organization dedicated to automotive industry
APPLIANCE

- A full range of coatings exclusive to this sector, liquid and powder.
- Coatings for plastics
- Creating novel colors and finishes
- A stock range of contemporary colors, and special requirements matched at our regional centers of expertise

FURNITURE

- Includes products for both engineered wood (e.g. MDF) and metal
- Advanced products available for special requirements such as anti-graffiti and scratch resistance
FUNCTIONAL

- Resicoat R4 Series for valves and fittings
- Approvals for drinking water in many major markets (Europe, USA, China....)
- Members of GSK – European quality association for heavy duty corrosion
- Resicoat R series for pipeline coatings
- Approx. 30 years track record
- Approvals from major oil and gas companies

What are our Experiences of Chemical Leasing?

- ABB Arab - Egypt

Other related experiences
- Interpon Extra
- Partnership Programmes
Akzo Nobel – ABB Arab - ENCPC

What was the situation before?

- Akzo Nobel was looking for not only customer satisfaction but also for customer “delight”
- Akzo Nobel was looking for a way to be ahead in the market
- Competition is very tough
- More services = More cost = prices increase!!!!
- Competitors can do the same

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Akzo Nobel – ABB Arab - ENCPC

ABB ARAB

- Has good line BUT!!
  - High consumption
  - High losses (12%)
  - High spare parts consumption
  - High cost for painting process per painted m²
Akzo Nobel – ABB Arab - ENPC

Akzo Nobel Offer

- Re-design the formulation
  - Improve the transfer efficiency
  - More powder on work piece
    = less losses
- Customise the particle size of the powder
  = less losses
- Recycle the powder lost by:
  - Spraying the internal parts
  - Reprocess again during the powder manufacturing
- Establishing Chemical Leasing project in collaboration with ABB ARAB and the Egypt National Cleaner Production Center

ABB Arab offer

- Re-adjust and fix the operating parameters for its powder coating line
- Nominate skilled operation staff to be supervised by Akzo Nobel
- Proper collection of fine powder waste
- Proper reporting system
- 100% of its electrostatic powder supply from Akzo Nobel
Akzo Nobel – ABB Arab - ENCPC

Situation Now:

- Chemical Leasing Contract for one year is in place between Akzo Nobel, ABB ARAB and the ENCPC.
- Basis for payment per m² of article coated.
- The contract includes all the technical, economical, management and environmental related issues.
- Monitoring phase in collaboration with the UNIDO- ENCPC (process losses below 5%)
- Partnership with UNIDO for promotion of Chemical Leasing and Cleaner Production

Akzo Nobel – ABB Arab - ENCPC

- Applied cost reduction for painting process for ABB (per m²)
- The chance for A/N to increase the relative price (per kg) of powder
- Waste - Reduced, Re-used, Reprocessed
- SHARING THE PROFIT reducing the IMPACT

Win Win Win situation
Benefits

- **Economical**
  - Forecast savings is around US$ 60,000 per year
  - Cost reduction per painted m²
  - Cost reduction in equipment maintenance

- **Environmental**
  - Closing the loop of solid waste
  - Improvement of workplace environment and workers safety
  - Reduction in the overall paint usage

- **Organisational and Quality**
  - Building skills of operation staff
  - Better quality of final product
  - Better intra-organization coordination (between different departments)
  - Better competitiveness

What are our other Experiences of “Chemical Leasing”??

- **Interpon Extra**
  - Reduction in powder consumption via cost/m² agreements
    - Electrolux – Hungary – 1997
    - Caradon – Benelux – 1997

- **Partnership Programmes**
  - Reduction in overall cost of painting via plant optimisation
  - Utilities and material savings
    - Bosch – UK – 2006/7
    - Esmena – Spain – 2006/7
    - Eldon – Spain – 2006/7
Conclusion

- Chemical Leasing is a win-win-win situation between the supplier and user of chemicals and the environment.
- The results of the current projects are the first and valuable step for further development of the concept.
- Support from international chemicals suppliers is crucial
- Further ChL pilot projects worldwide to disseminate the results are required.
- An effective tool for more competition and innovation.

What are our expectations for the future?

- Why is UN Cleaner Production Programme important to us at Akzo Nobel?
CORPORATE SOCIAL RESPONSIBILITY

"Conducting business in ways that produce social, environmental and economic benefits for the communities in which we operate in order to maintain our license to operate"

Management of CSR / QHSE in Powder Coatings

Product Stewardship programmes

- Reduction of hazardous materials
- Working with customers to improve HSE aspects

Adherence to Business Principles Specifications

- Human rights, Fair competition, Business integrity, Community activities and Compliance
What are our expectations for the future?

- Experience of potential “pit-falls”.
- Develop concept further within UNIDO model in new markets.

Points to covered:

1. Who are Akzo Nobel Powder Coatings?
2. What are our experiences of Chemical Leasing?
3. What are our expectations for the future?

Thank You
APPENDIX IV – PICTURES

Get together on Wednesday evening
City tour in Veszprém.
APPENDIX V – ATTENDANCE LIST

**Abo Sena** Ali (Egypt)
Egypt National Cleaner Production Center

**Adams** Hans-Norbert (Switzerland)
Dow Europe GmbH

**Andras** Bezegh (Hungary)
Corvinus University of Budapest

**Athanassoff** Ibolya (Hungary)
Veszprém County Council / Veszprém Megyei Önkormányzat

**Bial** Margit (Hungary)
Viriditas 3000

**Bihari** Gyula (Hungary)
Borsodchem Znt

**Cadavid** Carlos (Colombia)
Colombian Cleaner Production and Environmental Technologies Centre

**Csernus** Eva (Hungary)
ÁNTSZ Budapest IV.-XV. kerületi Intézet

**Csima** György (Hungary)
Veszprém County Council / Veszprém Megyei Önkormányzat

**Csordás** András (Hungary)
Materiál Végipari Szövetkezet

**Czaun** János (Hungary)
City of Veszprém

**Deloff-Bialek** Anna (Poland)
Bureau for Chemical Substances and Preparations

**Dunjić** Branko (Serbia)
Center for Cleaner production of Servia

**Farag** Ference (Hungary)
Grundfos Hungary Manufacturing Ltd.

**Fehri** Yasser (Morocco)
Morocco, Maghrebail

**Ferjanzsik** Zsombor (Hungary)
DENKSTATT Hungary Környezettechnológiai és -management Tanácsadó Kft

**Fesu** Gabriella (Hungary)
DENSO Manufacturing Hungary Ltd

**Fótyi** Mária (Slovakia)
Duslo, a.s. Šaľa

**Fulop** Istvan (Hungary)
International Conference
Getting Fit For REACH Applying Chemical Leasing
Balatonfüred (Hungary), March 6th – 7th, 2008

Akzo Nobel Powder Coatings Ltd

Frank Markus (Germany)
SAFECHEM Europe GmbH

Gálfy István (Austria)
Austrian Consulate / Osztrák Konzulátus

Hahn Maria (Austria)
Austrian Consulate / Osztrák Konzulátus

Háhn Péter (Hungary)
Middle-Transdanubian Regional Development Agency

Hanzaz Hanan (Morocco)
Moroccan Cleaner Production Centre (CMPP) / UNIDO

Herzcog Edit (Hungary)
Member of the European Parliament

Jadczyk Patrycja (Poland)
Bureau for Chemical Substances and Preparations

Jakl Thomas (Austria)
Austrian Federal Ministry of Agriculture, Forestry, Environment and Water Management

Joas Reinhard (Germany)
BiPRO GmbH

Kaltenegger Ingrid (Austria)
JOANNEUM RESEARCH, Institute for Sustainable Techniques and Systems

Kanizsay Zsolt (Hungary)
Grundfos Hungary Manufacturing Ltd.

Katona Ágnes (Hungary)
Kromberg & Schubert Kft

Keresztes Katalin (Hungary)
Brenntag Hungaria Kft.

Kovács Csaba (Hungary)
MAL Zrt.

Kovacs Erika

Kovács-Dunai András (Hungary)
Rába Automotive Components Manufacturing Ltd.

Kovats Nora (Hungary)
University of Pannonia, Institute of Environmental Engineering

Kozak Kristof (Hungary)
Min. Environment and Water

Körtvelyessy Gyula (Hungary)
Hungarian Chemical Society
International Conference
Getting Fit For REACH Applying Chemical Leasing
Balatonfüred (Hungary), March 6th – 7th, 2008

Kuan Duque Yuan Constantino (Colombia)
NCPC FROM COLOMBIA

Lasztovicza Jenő (Hungary)
Veszprém County Council General Assembly

László Tamaska (Hungary)
KM-Projekt Ltd.

Lesnjak Mirko (Slovenia)
LIVEO

Lilane Hanan (Morocco)
Moroccan Cleaner Production Centre (CMPP) / UNIDO

Loku-Gamage Lakmini (Sri Lanka)
National Cleaner Production Centre, Sri Lanka

Madsen Kaj (Switzerland)
United Nations Environment Programme, Division for Technology, Industry and Economics, Chemicals Branch

Marscheider-Weidemann Frank (Germany)
Fraunhofer-Institut für System- und Innovationsforschung

Mayrhofer-Grünbühel Ferdinand (Austria)
Austrian Ambassador in Hungary

McWhir Andrew (United Kingdom)
Department for Environment, Food and Rural Affairs

Mitra Swati (India)
c/o IKEA TRADING INDIA Pvt. Ltd.

Muranyi Istvan (Hungary)
KOZMOS (Hungarian Cosmetic and Home Care Association)

Németh Bernadett
MAPLÓ

Patel Mamta (United Kingdom)
Chemicalwatch

Peiris Sena (Sri Lanka)
National Cleaner Production Centre, Sri Lanka

Perez Jorge (Mexico)
Centro Mexicano para la Produccion mas Limpia

Plas Christian (Austria)
Denkstatt GmbH

Priyadarshi Anurag (India)
Ikea Trading India Pvt., Ltd.

Pusch Eveline (Austria)
Denkstatt GmbH
Raab Christina (Austria)
UNIDO

Rafal Brykowski (Poland)
Bureau for Chemical Substances and Preparations

Reeke Mark (United Kingdom)
Akzo Nobel Powder Coatings Ltd

Richter Steffi (Germany)
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AFC-Consultig (Austria)

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EMERSON PROCESS MANAGEMENT MAGYARORSZÁG Kft.

Tancsiscnè Horváth Ágnes (Hungary)
Kromberg & Schubert Kft

Tatar Carmen (Romania)
Ministry of Economy and Finance

Volk Marion (Germany)
TÜV SÜD Management Service GmbH

Zilahy Gulya (Hungary)
Zsolt Bodnar (Hungary)
Hunest Biorefinery Kft