

# Chemical Leasing

## A model for sustainable businesses in the chemicals area”

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### *Executive Summary*

#### ***Introduction***

In today's industrial society, numerous chemical substances are used in a broad range of products and processes. During or after their use, these substances are released to the environment to a varying extent and may lead to pollution. This results into both ecological and — due to unnecessary losses — economic disadvantages. Sustainable material management has to pursue both economic and ecological objectives in order to succeed in increasingly fierce and more global competition. Material flows have to be optimised in quantitative and qualitative terms so that the services in question can be rendered with maximum efficiency and minimal emissions.

Moreover, business quarters are generally aware of the fact that only those companies will survive that continuously improve their performance while enhancing customer orientation and, above all, avoiding excessive resource consumption.

Potentials for optimisation are mainly seen in promoting new business models in which profits do not result from the quantity of chemicals sold, but rather from the services rendered by means of the chemicals.

In order to assess the possibilities for the practical application of this approach in Austria, the Environment Ministry as well as major companies supported two studies to evaluate and describe suitable companies/business fields in a comprehensive way. They covered the identification of ecological and economic potentials, the description of obstacles and benefits as well as the definition of approaches to implementation.

The studies were carried out by two German-Austrian consortia with great expertise in the scientific analysis of material flows and business fields in the chemical industry. These were: **ECOTEC-Munich in co-operation with the Institute for Industrial Ecology in St. Pölten and AFC-Consult, Vienna, in co-operation with BIPRO, Munich.**

The study design required the identification of starting points for chemical leasing in close co-operation with all the stakeholders involved. Therefore, manufacturers and users of chemicals, leasing companies, waste managers, associations and authorities were strongly involved in the development of the concepts. In the course of this work, contacts were established to a great number of Austrian chemical users.

#### ***What is chemical leasing?***

The term “chemical leasing” refers to a business model in which chemicals needed for a specific service are not simply sold to the customer, but — in contrast to the traditional business model (“supplier sells chemicals to the user”) — are made available for use and are maintained.

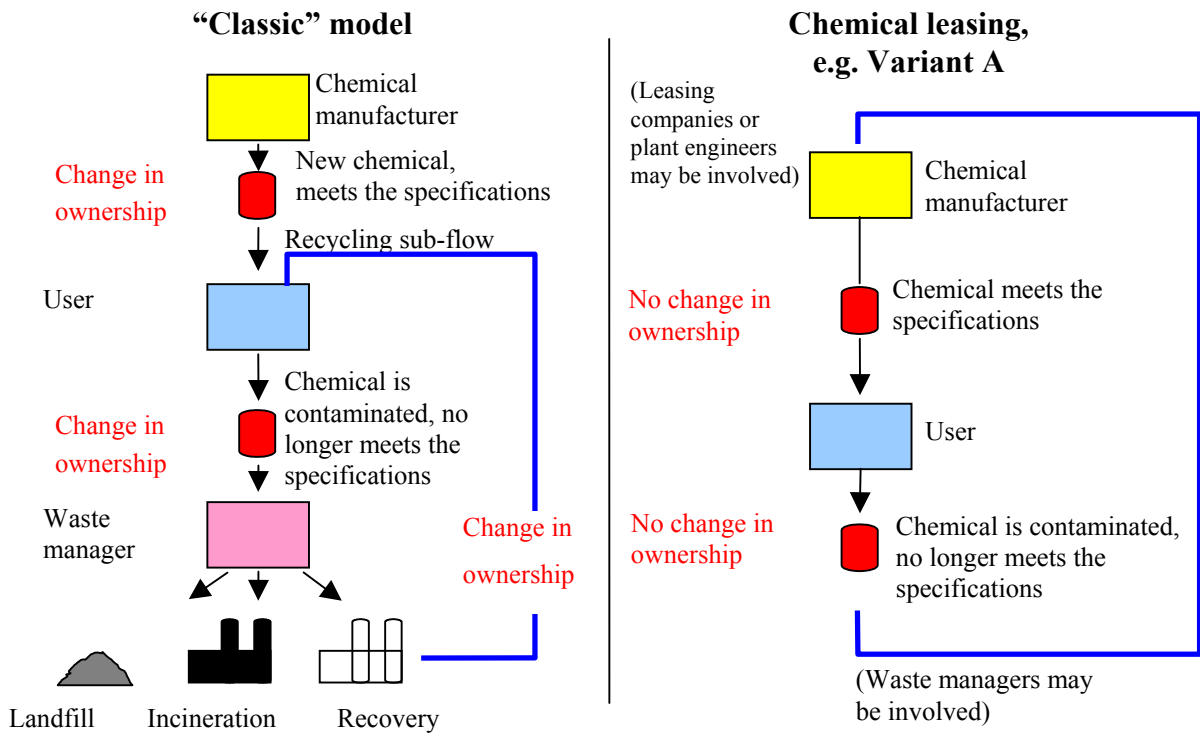
For example, a company supplies a substance for a specific service (e.g. cleaning, solving, reacting), but retains ownership, takes back the substance, performs recycling operations and also advises the user. In this business transaction, the focus no longer is on the change in ownership, and business interests are no longer linked to maximising chemical sales. In the case of degreasing by means of solvents, for example, the business process is oriented to the area of surfaces cleaned instead of the amount of solvents used for this purpose. As a result, the focus on “sales volumes” is abandoned in favour of service-oriented performance.

After all, if business interests are no longer related to the sale of chemical substances, but to the sale of chemical services, it is in the interest of all the parties involved to use the substances in question with maximum efficiency. This clearly is the environmental policy motivation for this new focus.

#### ***Variants of chemical leasing***

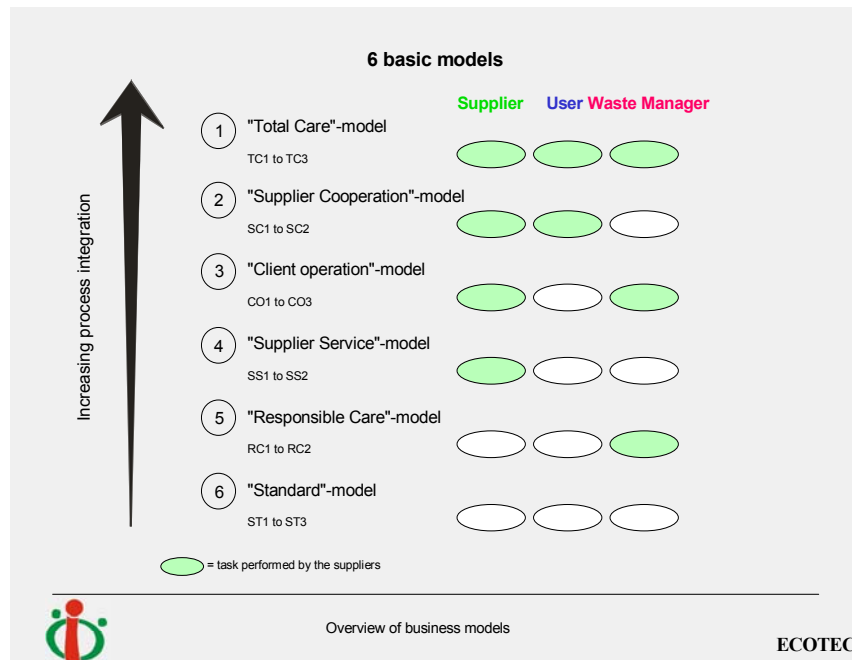
The concepts developed for “chemical leasing” within the framework of this report, however, go beyond the relatively narrow interpretation of the term “leasing”. In a broader sense, chemical leasing means that the change in ownership is not in the foreground of the supply of chemicals.

Several variants of chemical leasing can be differentiated depending on who owns/is responsible for the chemicals or the installations in which they are used.



BIPRO/AFC  
Figure 1-3: Comparison of the classic model with Variant A of chemical leasing

There are several basic types of potential business models that are characterised by an increasing shift of responsibility to the suppliers. These basic types can be divided into several sub-categories. Such a typology makes it possible to structure and categorise the numerous approaches applied in practice, to identify, represent and describe practical conditions, to establish analogies and differences, to make comparisons and to find transferable mechanisms.



## Central questions on chemical leasing

- (1) Which parameters are decisive for these business models?
- (2) Which applications/markets exist for chemical leasing in Austria?
- (3) Which applications and models are already standard practice at an international level?
- (4) How great are the ecological and economic potentials of this win-win situation in Austria?
- (5) What are the obstacles (-) and benefits (+) perceived by potential customers in Austria?

### (1) Which parameters are decisive for these business models?

A business model like the one described above requires that certain conditions are met. The essential parameters are:

- Possibility to consider the use of chemicals to be a service (e.g. cleaning, solving, greasing);
- Availability of suitable partners (chemical manufacturers, plant engineers, waste managers, leasing companies);
- Level of specialisation of the process or installation in which the chemicals are used;
- Integration and significance of the application in the production process of the user.

(+)

The model is basically suitable for the following chemicals:

- Capital-intensive substances (e.g. catalysts, anode material, precious metals, speciality chemicals);
- Expendables that do not form part of the final product and can be recycled after use;
- Substances with relatively high concentrations in wastewater, exhaust air or waste.

(-)

The following chemicals are not suitable for a change in ownership relations:

- Consumables that, as a result of their application, are released to the air where they are found in low concentrations (e.g. various solvents);
- Consumables that, as a result of their application, are introduced into wastewater where they are found in low concentrations (e.g. various soaps);
- Reaction educts.

### (2) Which applications/markets exist for chemical leasing in Austria?

A semi-quantitative analysis of the data available for Austria shows that the overall potential of the chemical leasing model amounts to an **annual input of around 153,000 tons of “chemical substances” and approximately 3,900 relevant companies.**

Application	Companies	Mengen	
Cleaning/degreasing			The number of * indicates as follows  for quantities in tons p.a., for companies their number):  * < 10 ** < 100 *** < 1,000 **** < 10,000 ***** > 10,000
• halogenated solvents	***	***	
• solvents not containing chlorine	***	*****	
• aqueous solutions	****	****	
Adsorption/desorption (AC)	***	****	
Pickling	***	*****	
Casting	**	*****	
Synthesis	**	***	
Extraction	**	****	
Cooling/greasing	***	*****	
Textile finishing - mercerisation	**	****	
Water treatment	***	****	
Catalysis	***	*****	
Cooling (commodities)	**	***	
Heating (using thermal oils)	**	****	
<b>Total</b>	<b>approx 3,900</b>	<b>153,000 tons</b>	



Current applications, semi-quantitative analysis


ECOTEC

### (3) Which applications and models are already standard practice at an international level?

Shorter product lives, faster technological development as well as a supply surplus due to the emergence of global markets have resulted in the initial application of new business models in the automotive, electronic and clothing industries.

Application	Substance	Supplier	User	Basic model						
				1	2	3	4	5	6	
Cleaning/degreasing, dry cleaning	CHC	DOW	various Users, Europe							
Reinigen/Entfetten, Chemischreinigung	CHC	Geiss	various Users, D							
Phosphate treatment	metal phosphates	Henkel	Ford, USA/B							
Cleaning/degreasing (painting)	aqueous cleaning agent (paint system)	BASF/ Henkel	Daimler-Chrysler, D							
Cleaning (CIP, containers, bottles)	lye, acid	Henkel	beverage industry, D							
Cleaning/degreasing (painting)	aqueous cleaning agent (paint system)	Eisenmann	VW, E							
Solvent application in general	solvent (VOC)	DOW	diverse, CH				X			
Heating	thermal oil	DOW + DAL	DuPont (D)		X	X				
Cleaning/degreasing (painting)	aqueous cleaning agent (paint system)	not decided	BMW (new Factory)		X?	X?				
Utilisation of chemicals	all chemicals	one central supplier (tier 1)	General Motors, USA							

■ = implemented    X = in planning

 Approaches implemented and planned and their assignment to business models ECOTEC

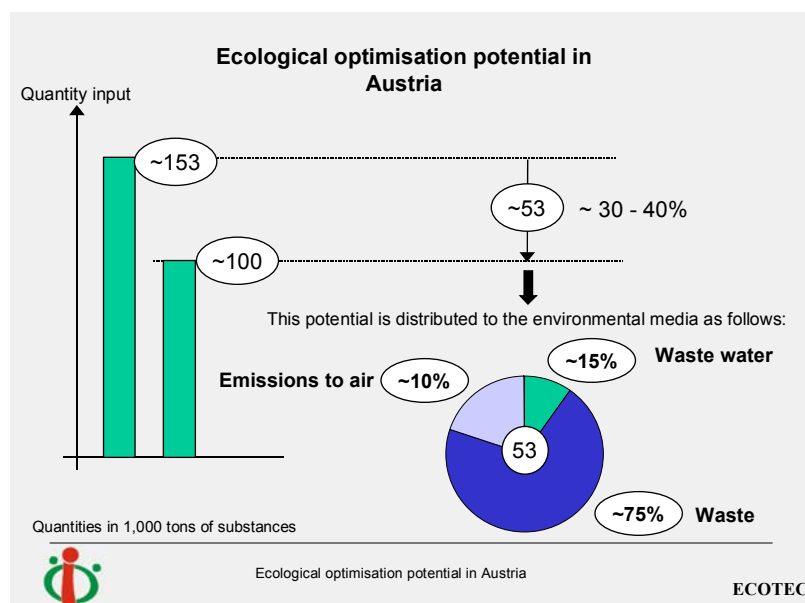
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#### (4a) How great is the ecological potential of this win-win situation in Austria?

##### Benefits for the environment:

Taking into consideration the entire Austrian market and only those companies that could apply the service-oriented business model, the **quantity of chemicals used up to now would be reduced by approximately one third** — without any change in the level of activities.

- This corresponds to chemical substances of around 53,000 tons per year that would not have to be used nor paid for and, hence, would not result into emissions nor waste. This reduction would be distributed to the individual environmental media as follows: 10% emissions to air, 15% emissions to water and 75% waste.



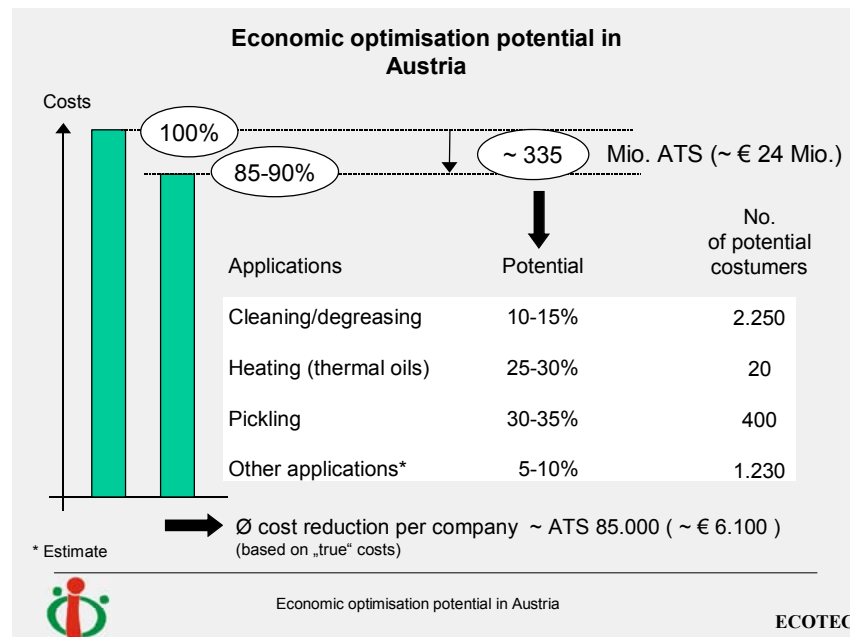
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#### (4b) How great is the economic potential of this win-win situation in Austria?

Benefits for the economy:

Especially in the environmental field, the aspect of additional costs caused by environmental protection has dominated the discussions for many years. All the more surprising are the results with regard to the economic consequences of ecological optimisation potentials:

- **On average, the companies adopting the new business model can expect a reduction in costs by up to 10-15%, primarily resulting from efficiency gains.** The biggest benefits will be reaped by companies operating facilities for cleaning / degreasing and pickling work pieces. In contrast to the apparently plausible assumption, however, the chemical suppliers will also be able to benefit from this situation in the mid-term because now they can also contribute their know-how in a profitable way.
- **The overall reduction potential for Austria totals € 24 million.**



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#### (5) What are the obstacles (-) and benefits (+) perceived by potential customers in Austria?

##### For chemical manufacturers and suppliers:

- |  |  |
|--|--|
| + stronger customer ties   | - logistic efforts                               |
| + sale of existing know-how and previously free services   | - training efforts                               |
| + better identification of customer needs  | - liability issues                               |
| + enhanced opportunities for the development of new products and the optimisation of existing ones               | - security in case of economically weak partners |
| + improved overview and control of waste flows with a view to product responsibility — existing trade structures |  |

##### For plant engineers:

- |  |   |
|--|---|
| + stronger customer ties                                 | - high capital needs, high capital tie-up         |
| + extended range of products/services offered            | - security in case of economically weak companies |
| + sale of existing know-how and previously free services | - increased administrative burden                 |

For the user:

- |   |   |
|---|---|
| <ul style="list-style-type: none"> <li>+ availability of “chemical know-how”</li> <li>+ more security</li> <li>+ optimised utilisation of chemicals, also with regard to existing policy principles</li> <li>+ avoidance of uneconomical capacities</li> <br/> <li>+ cost reductions</li> </ul> | <ul style="list-style-type: none"> <li>- dependence due to strong customer-supplier relations</li> <li>- less flexibility</li> <li>- flow of know-how to competitors via chemical manufacturers and plant engineers</li> <li>- rationalisation effects for the current owners of know-how among the users if the co-ordinating partner is a new third party</li> <li>- insecurity about the compliance with technical specifications in case of an external plant</li> <li>- technical and logistical problems with regard to the delivery and dispatch of products in case of an external plant or the integration into processes</li> </ul> |
|---|---|

For the financing institution:

- |   |   |
|---|---|
| <ul style="list-style-type: none"> <li>+ new business fields</li> </ul> | <ul style="list-style-type: none"> <li>- unclear handling of chemicals</li> <li>- risk</li> </ul> |
|---|---|

For the waste managing/recycling company:

The company reclaiming “used” chemicals may be faced with several changes due to the implementation of models optimising the utilisation of chemicals. The volumes to be treated may decrease in case of optimised utilisation, which basically is an obstacle. However, a sub-division of the market (into companies participating in chemical leasing and those not participating) may result into various advantages and disadvantages. Due to the fact that optimised utilisation also aims at reducing environmental pollution which is mainly caused by emissions to air and water, volume-related effects for the recycling company can be off-set at least in part.

**Conclusion**

In order to eliminate potential obstacles to the introduction of the new model, the following measures have been taken:

- (1) Guidelines: Guidelines have been attached to the final report that help companies interested in assessing whether approaches in the form of “chemical leasing” are advantageous for them and how they should design the basic framework.
- (2) Pilot projects: The Environment Ministry supports pilot projects on the operationalisation of these approaches. In selected sectors/companies, the introduction of the new business model of “chemical leasing” is assisted and monitored. The experiences gained will be analysed and commented on.
- (3) Austria’s know-how and, hence, its leadership in this field will be presented under the heading of “Experiences and perspectives of service-oriented strategies in the chemical industry and in related areas” at a conference to be held under the auspices of OECD in Vienna in the autumn of 2003. The objective of this event is to evaluate possibilities for establishing service-oriented models, such as chemical leasing, in the chemical industry and in related areas.