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# CHEMICAL LEASING MANUAL



**RESOURCE EFFICIENT  
AND CLEANER  
PRODUCTION CENTRE**

2017



Resource Efficient and Cleaner Production Centre

# **CHEMICAL LEASING MANUAL**

**2017**



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# 1. CHEMICAL LEASING BACKGROUND

Chemicals provide society with a wide range of benefits, particularly increased agricultural and industrial productivity. On the other hand chemicals have the potential to cause considerable health and environmental problems throughout their life cycle, from production through to disposal [1].

Air pollutants can cause respiratory diseases in humans and have an impact on the environment, e.g. in the form of acid rain or the greenhouse effect. Chemicals discharged into water bodies can poison the organisms living in these ecosystems or lead to extreme algae growth, which is the case with nitrate. High nitrate levels in drinking water can also pose a special risk to humans, since the nitrate can be transformed into carcinogenic compounds and lead to colon cancer. Chemicals that are found in the soil can affect humans and the environment as well. Heavy metals in farmland, for instance, not only affect the organisms in the soil, but also humans who consume the crops grown on that soil [1].

To protect human health and the environment chemicals therefore have to be managed safely to prevent harm to humans or the environment. This approach is called **Sustainable Chemicals Management** (SCM) [1].

The concept of **sustainable chemistry** exists to link preventative protection of the environment and health with an innovative economic strategy that will also result in more jobs. It is a broad-ranging area that concerns stakeholders in the scientific community, the economy, public authorities, and environmental and consumer advocate associations. By this, it contributes to the improvement of

resource efficiency and risk minimization in the chemical industry and aims at an environmentally friendly production and use of chemicals including, for example, the prevention of pollution and waste, the inclusion of the entire life cycle of a product, or the enhancement of a product's recyclability and durability [2].

**United Nations Industrial  
Development Organization**

**(UNIDO)** fully acknowledges the role the chemical industry plays in the global economics through contribution to wealth creation and poverty reduction. The

development of sustainable consumption and production patterns across industries, including the sound management of chemicals, is at the core of UNIDO's mandate of promoting

**Inclusive and Sustainable  
Industrial Development (ISID) [2].**



In the frame of UNIDO's programme portfolio to achieve the Sustainable Development Goals, UNIDO and the **United Nations Environment Programme (UNEP)** collaborate to foster the uptake of **Resource Efficient and Cleaner Production (RECP)** globally. RECP refers to the continuous application of preventive environmental strategies and total productivity methods to processes, products and services to increase efficiency and reduce risks to humans and environment. RECP achieves the three sustainability

dimensions individually and synergistically: Production Efficiency – improving the productive use of resources, Environmental Protection – minimizing the impact of industry on nature and Social Enhancement – the support of communities and risk management for the well-being of workers and employees [2].

Under the RECP Programme, 50 developing and transition countries have been supported since 1994 with the creation of entities including the **National Cleaner Production Centres (NCPCs)**. They deliver RECP services to enterprises, governments and other stakeholders through information sharing, professional training, plant level RECP assessments, policy advice and support for technology transfer and investment [2].



In 2009, the NCPCs, UNIDO, UNEP, and development partners (led by the Government of Switzerland) resolved to establish a global network to improve and facilitate networking and knowledge sharing. **The Network for Resource Efficient and Cleaner Production (RECPnet)** brings together over 70 providers of RECP services on a global level in order to catalyze the effective and widespread application of RECP in developing and transition countries. It does so by providing specialized, quality-assured, technical and advisory services and by facilitating and synergizing its members' capacities [2].

UNIDO's **Global Chemical Leasing Programme** is based on the preventive Resource Efficient and Cleaner Production (RECP) concept and stands as an example for UNIDO's approach of counteracting the negative effects of industry on the environment while maintaining competitiveness and enabling sustainable growth. **Chemical Leasing** is UNIDO's response to the unsustainable management of chemicals in industries and lack of cooperation among chemicals producers and users [2].



The Global Chemical Leasing Programme was founded in 2004 with the direct support of the Government of Austria. Since its foundation, NCPCs and RECPnet have increasingly become engaged in the global adoption of Chemical Leasing business models across sectors. Chemical Leasing fits into a broad context of international and national initiatives and obligations, and is intended to help policy- and decision-makers bring fresh momentum to chemical management and sustainable production [2].

UNIDO's Global Chemical Leasing Programme contributes to the UN **Sustainable Development Agenda 2030** and addresses in particular **Sustainable Development Goal 9**, “Build resilient infrastructure, promote inclusive and sustainable industrialization and foster innovation”. It also relates directly to the SDGs 3, 6, 12 and 13 [3].

### **Target 3.9**

“By 2030, substantially reduce the number of deaths and illnesses from hazardous chemicals and air, water and soil pollution and contamination” [3].

### **Target 6.3**

“By 2030, improve water quality by reducing pollution, eliminating dumping and minimizing release of hazardous chemicals and materials, halving the proportion of untreated wastewater and substantially increasing recycling and safe reuse globally” [3].



## Target 12.4

“By 2020, achieve the environmentally sound management of chemicals and all wastes throughout their life cycle, in accordance with agreed international frameworks, and significantly reduce their release to air, water and soil in order to minimize their adverse impacts on human health and the environment” [3].



## Chemical Leasing and SAICM

The **Strategic Approach to International Chemicals Management (SAICM)** was adopted in 2006 by the International Conference on Chemicals Management (ICCM) “to foster the sound management of chemicals” around the world. SAICM provides a framework for efforts to achieve the 2020 goal set out in the Johannesburg Plan of Implementation. This goal renews the commitments made at the UN Conference on Environment and Development (UNCED) held in Rio de Janeiro in 1992, and reconfirmed at the UN Conference on Sustainable Development held in Rio in 2012. SAICM is supported by the Inter-Organization Programme for the Sound Management of Chemicals (IOMC), established in 1995. A major focus of the IOMC is to support countries in their efforts to implement SAICM [2].

The following excerpt from the Summary Report of the International Conference on Chemicals Management (ICCM1, Dubai, 2006) exemplifies how the Global Chemical Leasing Programme attracted the attention of the stakeholders of the SAICM process: “In 2006, at the ICCM1, the participating countries finally adopted a resolution on SAICM by signing the Dubai Declaration on International Chemicals Management. The signing countries thereby committed themselves to promote the sound management of chemicals and hazardous wastes at all levels. An effective means of translating this idea into public policy is the implementation of Chemical Leasing. The concept of Chemical Leasing is particularly in line with SAICM, because both aim at a sound management of chemicals throughout their life cycle, and a responsible way of use that leads to the minimization of adverse effects on human health and the environment. SAICM wants to encourage support of developing countries in strengthening their capacity for the sound management of chemicals. If applied in a transnational context, Chemical Leasing can contribute precisely to this objective and to technology transfer from industrialized to developing countries in general. This conclusion was also drawn at the UNIDO-Austria side event at ICCM1, where the concept was introduced to the international community. More than 100 representatives from governmental institutions, industries, IGOs and NGOs participated in this side event” [2].

As an effective policy instrument, SAICM is a well-established mechanism that holds the potential to kick-start Chemical Leasing projects. SAICM presents the opportunity to promote innovative projects that encourage the development of business cases for sustainable and green chemistry. Chemical Leasing can be applied in all areas identified by SAICM, as it is applicable across industrial sectors [2].

They are designed to:

- a) reduce risks;
- b) enhance cooperation and information exchange between stakeholders;
- c) support good governance of chemicals;
- d) train employees in the sound management of chemicals [2].

The only requirement is that the chemicals targeted in SAICM projects can be defined or “quantified” by means of a unit of payment rather than by their quantity. If this is the case, Chemical Leasing can support SAICM implementation [2].

## **Chemical Leasing and REACH**

The European Union (EU) regulation **REACH** (“**Registration, Evaluation and Authorization of Chemicals**”) was adopted in 2006 to improve the protection of human health and the environment from the risks that can be posed by chemicals, while enhancing the competitiveness of the EU chemical industry. REACH also promotes alternative methods for hazard assessment of substances in order to reduce animal testing. In principle, REACH applies to all chemical substances, not only to those used in industrial processes but also to those that are present in our day-to-day lives, for example in cleaning products, paints, in clothing, furniture and electrical appliances. The regulation therefore impacts most companies across the EU. REACH places the burden of proof on companies.

To comply with the regulation, companies must identify and manage the risks linked to the substances they manufacture and market in the EU. They have to demonstrate how the substances can be used safely, and they must communicate risk management measures to the users [2].

Based on this context, a discussion arose on the subject of how Chemical Leasing could support the objectives of regulative legislations such as REACH:

1. Chemical Leasing and REACH share the same philosophy of sharing the costs, benefits, responsibility and know-how between chemical suppliers and users.
2. Like Chemical Leasing, REACH aims to impact a wide range of companies across many sectors, including manufacturers, importers, exporters and downstream users.
3. Chemical Leasing secures compliance with the obligation or duty to handle chemicals with care. This implies that chemicals and their applications are not only monitored but also managed with maximum accuracy. This is fully aligned to the principles of REACH.
4. Chemical Leasing is also an effective tool for demonstrating adequate risk control, as specific parameters must be fulfilled in order to obtain authorization. Adequate control is an inherent principle of REACH.
5. Chemical Leasing has the potential, in the long run, to accelerate the substituting of the most hazardous substances with less dangerous ones. In the future, Chemical Leasing models could be designed to trigger “fast track” licensing procedures and special conditions such as reduced registration/authorization fees within the REACH application process [2].

From a business perspective, Chemical Leasing fully fits in with voluntary sustainability reporting tools and management systems. It can help companies meet legal requirements relating to, for example, substance control, environmental permits, and occupational health and safety requirements [2].

## **2. CHEMICAL LEASING CONCEPT**

**Global Chemical Leasing Programme** has been and continues to be UNIDO's response to unsustainable management of chemicals in industries and lack of cooperation among chemicals producers, suppliers and users. It forms part of UNIDO's strategy to assist enterprises around the globe in achieving inclusive and sustainable industrial development [2].

Traditionally, chemicals are sold to customers who use them to fulfill certain functions. Chemicals suppliers have an 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 in larger amounts. Higher prices, however, are difficult to be achieved due to international competition. As a result, it is a common business practice to place a main focus on higher sales volumes. However, in many cases this is associated with negative impacts on the environment and negative consequences for the future availability of resources [2].

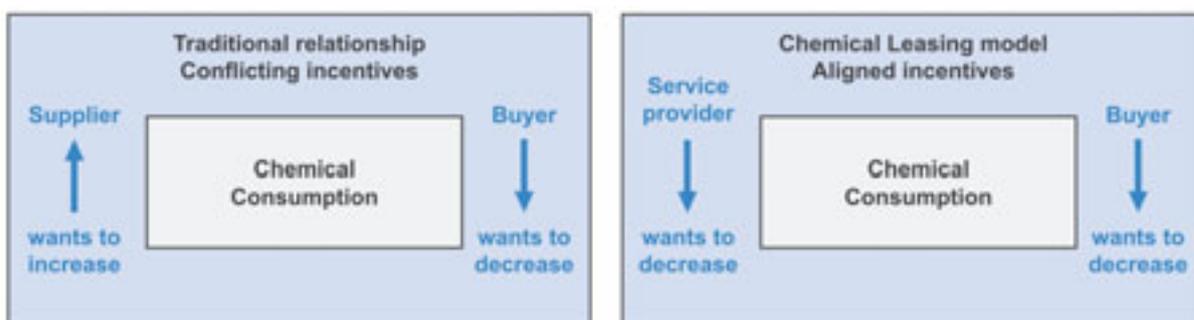
**Chemical Leasing** inverts a supplier's commercial interest in a higher consumption of chemicals. It shifts the focus from increasing the sales volume of chemicals to a value-added approach. Under Chemical Leasing the supplier sells the functions performed by the chemical and functional units (number of pieces cleaned, amount of area coated, etc.) become the main basis for payment. Chemical Leasing concept is illustrated in Figure 1 [2].



*Figure 1: Illustration of the Chemical Leasing concept [2]*

**Example:** “A producer of metal parts needs detergents to clean them. Instead of being paid for the amount of detergent provided, the chemical supplier sells the functions performed by the detergent, such as the cleaned metal parts” [2].

In order to increase profit margins, the supplier trains the user’s employees to optimize the usage of the detergent and reduce the amount of detergent consumed. By decoupling the payment from the consumption of chemicals, Chemical Leasing aligns incentives, bringing about a win-win situation for both the chemical supplier and the user. Figure 2 illustrates the distinctive approach of Chemical Leasing compared to traditional business models [2].



*Figure 2: The Chemical Leasing approach [2]*

Since chemical products provide a broad variety of services (such as cleaning, coating, colouring and degreasing), Chemical Leasing is applicable in a multitude of industry sectors in large companies, as well as in SMEs. Experience has proven that best results are achieved when the model is applied to processes that are not the core know-how of the chemical user [2].

Chemical Leasing is a one-of-a-kind sustainable business model, bringing clear environmental, economic and social benefits. Chemical Leasing leads to more efficient and economic use of chemicals and to lower water, raw material and energy consumption, significantly reducing the environmental impact of the production process. By sharing the added value created through the more economic use of chemicals, both the chemical supplier and user can gain an economic advantage. Unlike the outsourcing model, Chemical Leasing involves a transfer of knowledge from the supplier to the user, so there is no loss of jobs at the user's location. It helps reducing occupational health and safety risks and protecting human health from the hazardous effect of chemicals. The companies are better positioned to respond to the latest changes in international chemical policies and can enhance their access to new markets. It can also foster long-term collaboration between the partners, leading to innovation and the transfer of environmentally sound technology [2].

**UNIDO definition of “Chemical Leasing”.** For the dissemination and the establishment of Chemical Leasing in different industries and countries, a clear definition for a mutual understanding of Chemical Leasing is essential. As UNIDO plays a leading role in the development and implementation of Chemical Leasing around the world, in 2008 UNIDO defined “Chemical Leasing” jointly with an international working group as follows [2]:

- ✓ *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 management of the entire life cycle.*
- ✓ *Chemical Leasing strives for 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 (listed in Table 1).*

*Table 1: Key benefits of the Chemical Leasing business model [2]*

<b>Environmental benefits</b>	<b>Social benefits</b>	<b>Economic benefits</b>
Reduction of resource consumption	Reduced risks in chemical handling	Reduced costs
Reduced emissions and waste	Better qualification of workers due to training	Improved competitiveness
Reduced energy demand	Reduced health hazards	Better business partnerships

**Chemical Leasing Sustainability Criteria.** In line with the concept of sustainable development which became common language at the World's first Earth Summit in Rio in 1992, it is UNIDO's interest to ensure that all Chemical Leasing activities follow the principles of sustainability.

In response, detailed Chemical Leasing Sustainability Criteria have been developed that must be fulfilled by projects in order to be considered as "Chemical Leasing" case. Five criteria (shown in Figure 3) were formulated by international Chemical Leasing experts as a result of the first national Chemical Leasing initiative driven by the German Federal Environment Agency in 2009 [2].



*Figure 3: The Chemical Leasing Sustainability Criteria*

1. Reduction of energy and resource consumption and minimization of adverse impacts on the environment and health caused by chemicals, their application and production processes;
2. Improved handling and storage of chemicals to enhance risk prevention and protect human health;
3. No substitution of chemicals by substances with a higher risk;
4. Generation of economic and social benefits, continuous improvement and fair sharing of the benefits between the partners;
5. Monitoring and systematic recording of relevant data.

The Sustainability Criteria aim to clearly point to the fact that Chemical Leasing projects shall be performed under consideration of measurable and concrete ecological and economic improvements that can be achieved. At the same time, they are designed to protect the positive image of Chemical Leasing and to prevent the misuse of the term “Chemical Leasing”, e.g. for activities which are not beneficial to human health or the environment. The set of Sustainability Criteria has proven to be helpful not only for evaluating projects, but also for facilitating the negotiation process on Chemical Leasing projects by building trust between parties.

**Chemical Leasing and the Circular Economy.** For many decades, companies have followed linear sales models based on the assumption that resources are abundant, available, easy to source and cheap to dispose of. However, natural resources do not follow linear cycles. In order to building towards a circular economy, it requires new concepts that either replace existing ones or seize new opportunities.

Innovative business models such as Chemical Leasing accelerate the shift to the Circular Economy, because they are characterized by thinking about chemicals sales from a zero-waste and holistic life cycle perspective. Chemical Leasing contributes to the Circular Economy by establishing closed loop systems, enhancing know-how exchange between business partners and incentivizing resource efficiency (illustrated in Figure 4 below).



Figure 4: Chemical Leasing and the Circular Economy [2]

### 3. CASE STUDIES

#### 3.1. Chemical Leasing in Serbia

##### Bonding of boxes in the Serbian food processing sector [2]

**Background information.** Adhesives are part of a variety of food packaging materials. They can be used to manufacture rigid cardboard packaging (bonding of boxes) or to seal flexible packaging, including wrappers, pouches and lidding films. They can bind together layers of materials that come in contact with food or they can attach labels to an article to designate its origin. It is strictly forbidden by legislation to use adhesives in a way that could negatively affect food, change the nature, substance or quality of the food or could make it harmful to health and/or environment.

**Introduction.** A Serbian confectionary company, Bambi Banat, was approached by Henkel, one of the global leaders of chemical solutions for adhesives in the packaging business, with a proposal to

improve the packaging processes. Henkel proposed the usage of a new adhesive as it would enable the user to reduce packaging costs and improve environmental performance at the same time. Joint industrial trials were conducted to test the new solution before it was finally agreed that Chemical Leasing would be the most adequate means to introduce the new adhesive to the packaging processes of Bambi Banat. The Chemical Leasing contract was signed and prolonged on a yearly basis.

**Key challenges and results.** The Chemical Leasing business model was successfully implemented on six packaging lines. A new adhesive was chosen for the bonding of more than 20 different types of boxes in varying shapes and sizes. The product innovation came along with several process innovations related to the adjustment of process parameters, bringing about a significant reduction of adhesive consumption. Chemical Leasing enabled the Serbian company to cut costs significantly and to achieve environmental, economic and social benefits at the same time.

#### **Unit of payment applied**

Before Chemical Leasing – EUR per kilo of adhesive

After Chemical Leasing – EUR per bonded box (depends on the box type)

**Technical measures tested and implemented.** The former polyvinyl acetate based adhesive was replaced by a hydrocarbon resin based one. Technically, the adhesive was first melted and then dispensed to the surface of the boxes. For its efficient application, the process parameters, such as temperature and pressure, were optimized (lowered) compared to the situation before the introduction of Chemical Leasing.

## Results achieved

Before Chemical Leasing	After Chemical Leasing
<ul style="list-style-type: none"> <li>✓ Operating temperature was 160°C</li> <li>✓ Operating pressure was 2.9 bar</li> <li>✓ Adhesive was added manually into the reservoirs</li> <li>✓ Melted adhesive had an unpleasant smell</li> <li>✓ The dispensing nozzles got clogged during the application due to the high-temperature melting process of the PVA based adhesive. This led to shortages and additional maintenance work</li> </ul>	<p><u>Environmental benefits:</u></p> <ul style="list-style-type: none"> <li>✓ Consumption of the adhesive significantly reduced (more than 30%)</li> <li>✓ Energy consumption reduced (new operating temperature 130°C, new operating pressure 2 bar)</li> </ul> <p><u>Economic benefits:</u></p> <ul style="list-style-type: none"> <li>✓ Costs for the adhesive were reduced by €4,000 per year</li> <li>✓ Energy costs were reduced</li> <li>✓ Maintenance costs were reduced by €10,000 per year</li> <li>✓ The team efforts of user and supplier created the basis for a long-term relationship</li> </ul> <p><u>Social benefits:</u></p> <ul style="list-style-type: none"> <li>✓ The automatic dosing system reduced the possibility of workers suffering burning injuries</li> <li>✓ Working conditions were improved: the new adhesive was odourless</li> <li>✓ Workers were trained on the safe use of chemicals</li> </ul>

### 3.2. Chemical Leasing in Russia

#### **Water purification in the Russian waste water treatment sector [4]**

**Background information.** A high potential and prospects of Chemical Leasing projects are determined by a rapid growth of the Russian economy, particularly chemical branches, causing a significant impact on the environment, outdated and poor conditioned wastewater purification facilities failing to decontaminate the effluents to the required level and strict environment protection legislation adopted in the country.

**Introduction.** A large (over 50%) part of glues, soaps and detergents in the Russian market is represented by either imported products or the production of Russian affiliations of foreign companies. The service provider in this case study is subsidiary of a worldwide known corporation and the largest producer of industrial and household glues, soaps and detergents in the North-Western region of Russia – Henkel-ERA. The service recipient is a share holding company specialising in R&D and service activities on industrial wastes disposal, wastewater purification, recycling of various chemicals and development of environment friendly regional programmes for hazardous wastes disposal and chemicals recycling – ERG. This small enterprise has a large experience in effective commercial implementation of efficient waste management approaches (processing, disposal, recycling) in different branches of industry such as galvanic processes, metallurgy, and production of organic compounds. In the recent years they are successfully performing a series of innovative projects relating to wastewater purification in different branches of industry.

**Key challenges and results.** The implementation of the ChL business model based on payment for the amount of purified water motivated both companies to cooperate in their efforts for process modernisation. The reconstruction of wastewater processing facilities and application of an advanced decontamination technology according to a know-how suggested by the service company provided the increase of purification quality to an environmentally appropriate level and a significant reduction in the consumption of all the chemicals used for wastewater decontamination.

### **Unit of payment applied**

Before Chemical Leasing – EUR per kilo of chemicals

After Chemical Leasing – EUR per cubic meter of purified water

**Technical measures tested and implemented.** The service provider has developed and installed the improved wastewater purification process at the user's facilities and currently supplies the minimised amounts of required chemicals ( $\text{FeCl}_3$ ,  $\text{NaOH}$ ) on the basis of Chemical Leasing. The company also takes care of the user's personnel training in the new process operation, the residual solid wastes transportation and disposal.



*Figure 5: Waste water treatment at Henkel [4]*



*Figure 6: Production of glues [4]*

## Results achieved

Before Chemical Leasing	After Chemical Leasing
<p>✓ Service company supplied chemicals and materials (iron chloride <math>\text{FeCl}_3</math>, sodium hydroxide <math>\text{NaOH}</math>, filter packs) for wastewater purification. However, the level of water decontamination at the existing facilities was insufficient in view of the glue production increase.</p>	<p><u>Environmental benefits:</u></p> <ul style="list-style-type: none"> <li>✓ Reduction of impurities contents in the glue production effluents to a level below the sanitary standards</li> <li>✓ Significant reduction of the amount of environmentally hazardous chemicals (<math>\text{FeCl}_3</math>, <math>\text{NaOH}</math>) used for wastewater purification</li> </ul> <p><u>Economic benefits:</u></p> <ul style="list-style-type: none"> <li>✓ More than 50% decrease of wastewater purification cost and required chemicals consumption mutually profitable for participating companies</li> </ul> <p><u>Social benefits:</u></p> <ul style="list-style-type: none"> <li>✓ The implementation of the advanced wastewater purification process is profitable for the service provider only in the case of Chemical Leasing application since the amount of supplied chemicals is significantly reduced</li> </ul>

### 3.3. Chemical Leasing in Ukraine

#### Use of agrochemicals in the Ukrainian agricultural sector

**Background information.** Large amounts of agrochemicals are produced and consumed worldwide. Globally, more than one million tonnes of pesticides and 50 million tonnes of fertilizers are consumed every year. In addition, dealing with and applying agrochemicals is a complex task with various activities and parameters involved. There are many factors associated with crop cultivation that cannot be predicted with accuracy (weather conditions, pests and diseases, etc.) or that largely depend on know-how. In Ukraine approximately 42 million ha of land (69% of the total land area) are under agricultural production. Traditional business models for chemicals used in agricultural applications have neither offered good incentives to prevent overconsumption of chemicals, nor have they promoted knowledge transfer between stakeholders. Hence, there is a great potential for optimizing the use of agrochemicals by means of innovative chemicals management.

**Introduction.** The Company «Enzim» (Supplier) is Ukrainian's dynamically progressing company specializing on development, manufacture and sale of enzymatic productions. "Enzim" is the biggest biotechnological company on the territory of Ukraine. In 2011, 520 tons of microbiological and enzymatic preparations (19 types) were produced. The company has about 190 employees, certified by IMO. The Joint German-Ukrainian Company "Interagroskvyra" (User) is an agrarian company with its fields' territory around 1,200 hectares and with about 45 employees. Company has around 400 hectares under winter grain crops. "Enzim" proposed an innovative approach by substituting part of the

essential chemical fertilizers by organic preparations. Applying its know-how, the Supplier developed and introduced the User both to the new preparations and to the plan for its application. The efficiency of the substitution not only depends on the lower quantity and lower cost of the organic preparations but also on its environment benefits and continuous advisory support from Supplier side. The Chemical Leasing contract was signed (Annex 1).

**Key challenges and results.** The importance of organic farming has become increasingly popular as overuse of chemicals and pesticides cause numerous health problems and pollute the land. The importance and value of organic fertilizers cannot be understated. By their nature, organic fertilizers increase physical and biological nutrient storage mechanisms in soils, mitigating risks of over-fertilization. Within the ChL model, chemical fertilizers were partly substituted by organic fertilizers (organic microbiological preparations) with no decrease in crop capacity.

#### **Unit of payment applied**

Before Chemical Leasing – USD per kilo of fertilizers

After Chemical Leasing – USD per 1 ha of arable land

**Technical measures tested and implemented.** Crops need a lot of nutrients to grow properly. Nutrients include both organic and NPK fertilizers. In general, the take-up amount of fertilizer during the growing period is 350 kg per ha of territory (200 kg applied along with the seed and then 150 kg - during the spring cultivation). It was agreed to substitute 250 kg of chemical fertilizers with organic preparations (5 litres per one ha) and a new method of fertilizing. A plan was also agreed upon for the protection of the wheat crops during the growth period.

## Results achieved

Before Chemical Leasing	After Chemical Leasing
<p>✓ 140 tons of chemical fertilizers and around 1,504 litres of chemical fungicides were applied on the territory of 400 ha covered with winter grain crops</p>	<p><u>Environmental benefits:</u></p> <ul style="list-style-type: none"> <li>✓ Reduced pollution of soil and water</li> <li>✓ Lower air emissions (90% of CO<sub>2</sub> emissions reduced)</li> <li>✓ Increased resource efficiency</li> </ul> <p><u>Economic benefits:</u></p> <ul style="list-style-type: none"> <li>✓ Reduced consumption of chemicals (53% of chemical fertilizers)</li> <li>✓ Substituted 75% of chemical fungicides</li> <li>✓ Cost savings</li> <li>✓ Development of the long-term relationship between user and supplier</li> </ul> <p><u>Social benefits:</u></p> <ul style="list-style-type: none"> <li>✓ Less exposure of field workers to hazardous chemicals</li> <li>✓ Less contaminated foodstuff for consumers</li> <li>✓ Low risks</li> </ul>

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# ANNEX 1

## ДОГОВІР № 1

про співпрацю у межах виконання проекту Організації Об'єднаних Націй з промислового розвитку «Сприяння адаптації та впровадженню ресурсоефективного та більш чистого виробництва шляхом створення і роботи Центру більш чистого виробництва в Україні»

м. Київ

«1» лютого 2012 р.

Дочірнє підприємство «Ензим», 24321, Вінницька обл., Тростянецький р-н, м. Ладизин, вул. Хлібозаводська, 2 тел/факс (04343) 6-10-56. р/р 2600614145 в ВОД Райффайзен банк «Аваль», м. Вінниця, МФО 302247, ЄДРПОУ 32813696, свідоцтво платника ПДВ 01230304 (далі – Постачальник), в особі директора Ковальова М.В. що діє на підставі Статуту, та Спільне українсько-німецьке аграрне підприємство «Інтерагро Сквиря», 09033, Київська область, Сквирський район, с. Ленінське, вул. Леніна, 28, р/р 26005108422 в «Райффайзен Банк Аваль», м. Київ, МФО 380805, ЄДРПОУ 1422459, індивідуальний податковий номер 142924510204, Свідоцтво №14041630, (далі – Споживач), в особі директора Сологуба Олександра Михайловича, що діє на підставі Статуту, та **Національний Центр більш чистого виробництва НТУУ «КПІ»** (далі – Консультант), в особі **в.о. Директора Шиловича Ігоря Леонідовича**, що діє на підставі Наказу, в рамках виконання проекту Організації Об'єднаних Націй з Промислового Розвитку (далі - ЮНІДО) «Сприяння адаптації та впровадженню ресурсоефективного та більш чистого виробництва шляхом створення і роботи Центру більш чистого виробництва в Україні» домовилися про наступне:

### 1. Предмет договору

**1.1.** Предметом цього Договору є встановлення взаємовигідної співпраці Сторін з метою впровадження моделі Хімічного Лізингу, а саме: Постачальник надає Споживачу речовину, яка заміщує використання споживачем хімічних препаратів біологічними, при цьому основою для оплати Споживачем Постачальнику стає ГРН/ГА якісно обробленої біологічним препаратом площі.

**1.2.** Роботи та послуги Консультанта, що проводитимуться у рамках реалізації Проекту, будуть здійснюватися за рахунок ЮНІДО.

### 2. Обов'язки Сторін

**2.1.** Постачальник у рамках співпраці:

- надає інформацію та дані щодо оптимізації виробничих процесів, пов'язаних з використанням хімічних речовин;
- співпрацює по вдосконаленню процесів;
- відповідає за кінцевий результат впровадження моделі Хімічного Лізингу.

**2.2.** Споживач у рамках співпраці:

- призначає відповідальну особу в компанії за впровадження Хімічного Лізингу;
- надає інформацію та дані щодо оптимізації виробничих процесів, пов'язаних з використанням хімічних речовин;
- бере на себе обов'язки сприяти проведенню ряду тестових випробувань для вдосконалення та оптимізації виробничого процесу;
- впроваджує запропоновану модель Хімічного Лізингу.

**2.3.** Консультант у рамках співпраці:

- відповідає за менеджмент проекту;
- проводить аналіз та розрахунки вигідності затрат сторін;
- надає підтримку з боку міжнародних консультантів;

- організовує навчальні семінари для сторін-учасниць;
- відповідає за ефективне розповсюдження досягнутих результатів на національному та міжнародному рівнях;
- після успішного впровадження моделі Хімічного Лізингу надає сертифікат ЮНІДО.

### **3. Конфіденційність інформації**

**3.1.** Сторони зобов'язуються не розголошувати та не використовувати у власних інтересах чи інтересах третіх осіб інформацію, що стала відома в результаті розробки та впровадження моделі Хімічного Лізингу без згоди.

**3.2.** Не є розголошенням та використанням у власних інтересах чи інтересах третіх осіб ознайомлення експертами з інформацією з метою реалізації Проєкту, в тому числі для здійснення оцінки даних, ідей та концепцій у відповідності з методикою ЮНІДО – «UNIDO Chemical Leasing Toolkit», який відповідає вимогам ISO 14001.

**3.3.** Інформація не буде вважатися такою, що не підлягає розголошенню чи використанню у власних інтересах чи інтересах третіх осіб, і Сторони не будуть мати ніяких зобов'язань конфіденційності відносно даної Інформації, якщо вона задовольняє хоча б одному з наступних пунктів:

- вже відома Сторонам;
- є або стає прилюдно відомою у результаті невірної, недбалої або навмисної дії однієї із Сторін;
- легально отримана від третьої сторони без обмеження та без порушення договору;
- незалежно розроблена Стороною за умови, що особа або особи, які її розробили, не мали доступу до конфіденційної Інформації;
- дозволена до розголошення чи використання письмовим дозволом;
- її розкриття вимагає Закон.

**3.4.** Під розголошенням в даному Договорі розуміється – ознайомлення шляхом дії або бездіяльності іншої особи без письмової згоди Сторін з Інформацією, якщо це завдало чи могло завдати шкоди одній із Сторін.

**3.5.** Під ознайомленням в даному Договорі розуміється розкриття, передання, недбале зберігання, надання доступу тощо.

**3.6.** Сторони гарантують забезпечення конфіденційності Інформації.

### **4. Відповідальність Сторін та вирішення Спорів**

**4.1.** Сторона, що не виконує або не належним чином виконує свої зобов'язання за Договором, несе відповідальність, передбачену чинним законодавством України.

**4.2.** У випадку виникнення спорів з питань, передбачених Договором або у зв'язку з ним, вони вирішуватимуться в порядку, встановленому чинним законодавством України.

**4.3.** Сторони звільняються від відповідальності за Договором, якщо невиконання або неналежне виконання його умов є наслідком дії обставин непереборної сили (форс-мажор). До обставин непереборної сили відносяться стихійні явища природного характеру (землетруси, повені, урагани, руйнування в результаті блискавки тощо), лиха техногенного та антропогенного походження (вибухи, пожежі, вихід з ладу машин, обладнання тощо), обставини суспільного життя (воєнні дії, громадські хвилювання, епідемії, страйки, бойкоти тощо), а також видання актів органів державної влади чи місцевого самоврядування, законні або незаконні заборонні заходи названих органів та інші дії, що не залежать від волі Сторони і унеможливають виконання Стороною зобов'язань за Договором або перешкоджають такому виконанню. Виникнення обставин непереборної сили, при умові повідомлення про них, продовжує термін виконання зобов'язань за Договором на період, який відповідає строку дії зазначених обставин і розумному терміну для їх усунення.

## 5. Заключні положення

- 5.1. Даний Договір набирає чинності з дати його підписання Сторонами і діє до **31 грудня 2012 р.** Умови Договору щодо конфіденційності діють безстроково.
- 5.2. Зміни та доповнення, додаткові угоди та додатки до цього Договору є його невід'ємною частиною і мають юридичну силу у разі, якщо вони викладені у письмовій формі та підписані уповноваженими на те представниками Сторін.
- 5.3. Після підписання цього Договору всі попередні переговори за ним, листування, попередні угоди та протоколи про наміри з питань, що так чи інакше стосуються цього Договору, втрачають юридичну силу.
- 5.4. У випадках, не передбачених цим Договором, Сторони керуються чинним законодавством України.
- 5.5. При виконанні Договору та окремих договорів Сторони зобов'язуються дотримуватися принципів корпоративної етики та конфіденційності.
- 5.6. Цей Договір укладений на 3-х сторінках у 3-ох оригінальних примірниках, які мають однакову юридичну силу, по одному для кожної Сторони.

## 6. Реквізити Сторін

### Постачальник

Дочірнє підприємство  
«Ензим»,  
р/р 2600614145 в ВОД  
Райффайзен банк «Аваль», м.  
Вінниця,  
МФО 302247, Є  
ДРПОУ 32813696,  
свідоцтво платника ПДВ  
01230304  
ПІН 328136902553

Адреса: 24321, Вінницька  
обл., Тростянецький р-н, м.  
Ладижин, вул.  
Хлібозаводська, 2,

Контактна інформація:  
Тел./факс: (0432) 6-10-56

Директор

/Ковалюк М.В./

І. П. А. Т. Н. А.



### Споживач

Спільне українсько-  
німецьке аграрне  
підприємство «Литерагро  
Сквира»  
р/р 26005108422 в  
«Райффайзен Банк Аваль», м.  
Київ, МФО 380805, ЄДРПОУ  
1422459, індивідуальний  
податковий номер  
142924510204, Свідоцтво  
№14041630

Адреса: 09033, Київська  
область, Сквирський район,  
с. Ленінське, вул. Леніна, 28,

Контактна інформація:

Тел./факс (04568) 55-0-00

Тел. (04568) 55-1-88

Тел, моб. (093) 445-77-77

e-mail: [info@litagro.com.ua](mailto:info@litagro.com.ua)

Директор «Литерагро

Сквира»

/Соловйов О.М./



### Консультант

Національний Центр більш  
чистого виробництва  
НТУУ «КПІ»

Адреса: 03056, м. Київ,  
пр-т. Перемоги, 37, кім. 3

Контактна інформація:

т./факс: (044) 406-80-62

e-mail: [ncpc@ukr.net](mailto:ncpc@ukr.net)

В.о. Директора

/Шилович Л.Л./

М.П.









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