



Case Studies

Circular Economy Implementation in Ukraine



Action implemented by:

Case Studies:

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It is a description of circular economy approaches and principles, complemented by national case studies of how they are implemented in local companies. The national cases were compiled through RECPC’s long-term collaboration with industrial companies and a survey of companies to showcase the implementation of circular economy models. In addition, the publication contains cases that RECPC experts collected from open internet resources.

About EU4Environment Action

The “European Union for Environment” (EU4Environment) Action aims to help the EU’s Eastern Partnership countries preserve their natural capital and increase people’s environmental well-being by supporting environment-related action, demonstrating and unlocking opportunities for greener growth, and setting mechanisms to better manage environmental risks and impacts. The Action is funded by the European Union and implemented by five partner organisations: OECD, UNECE, UNEP, UNIDO and the World Bank, between 2019 and 2024. For further information about the Action, please visit: www.eu4environment.org. For further information about RECP in Ukraine, please visit: www.recpc.org

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Kyiv, Ukraine

INTRO

The ongoing war in Ukraine for more than two years has resulted in significant losses to the economy, including the destruction of and damage to infrastructure, production facilities and institutions, and the loss of human capital and natural resources. The overall economic development of the country depends on the industrial development achieved. Providing timely support to national enterprises and facilitating their recovery and development is important to underpin Ukraine's economic sustainability. This path must also be sustainable and environmentally sound. Sustainability is a fundamental principle for achieving human development goals while safeguarding the natural resources and ecosystem services on which the economy and society depend.

Sustainable development practices help countries develop so they can adapt to the challenges of climate change. This helps to preserve important natural resources for future generations. Here, circular economy (CE) principles have become a viable alternative to the linear economy. In a circular economy, resources are not used just once. Instead, they are recovered, reused and consumed rationally, allowing for the creation of additional product value.

In Ukraine, the RECP Centre is UNIDO's National Implementing partner of the Result 2 "Circular Economy and New Growth Opportunities" component within the EU4Environment Action funded by the European Union.

One of the focus areas is the promotion of the circular economy and industrial waste management, involving the development of new business models based on the principles of ecological design, repair, re-use, recovery and exchange of products and waste prevention.

This publication is a compilation of national examples of circular economy approaches. To this end, we have used:



Centre's long-term cooperation with domestic industrial companies



Companies' survey on implementing CE models by filling in the form



Cases of implemented approaches found by the experts of the RECP Centre through open resources on the Internet

The RECP Centre would like to express its respect and gratitude to all the companies that have responded to and taken part in the survey on the implementation of CE models.

This publication does not include examples from all companies for objective reasons.

CIRCULAR ECONOMY AND ITS PRINCIPLES



According to UNIDO's definition, circular economy (CE) is a new economic model (alternative to linear) of creating value, and ultimately prosperity, through extending product lifespan and relocating waste from the end of the supply chain to the beginning - in effect, using resources more efficiently by using them more than once.

Moving to a circular economy aims to introduce resource-efficient and cleaner production systems that will allow companies to increase their competitiveness while helping to protect the environment. Indeed, companies can significantly reduce their production costs and waste generation by saving large amounts of water, energy and raw materials.

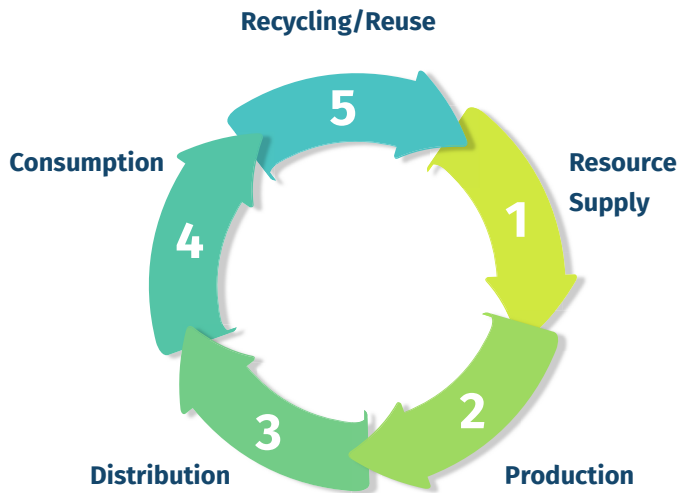
CE approaches are increasingly seen as central to the achievement of various SDGs. According to the World Bank, the relevance of circularity is to achieve **SDG 2, 3, 6, 7, 8, 9, 11, 12, 13 and 14.**



Sustainable development goals supported by the circular economy

The circular economy promotes the sustainable use of resources by minimising waste, reusing products and recycling materials to create a closed-loop product life cycle.

Product life cycle



Resource supply: prioritising the use of recycled and minimised environmental impact raw materials (throughout the entire lifecycle)

Production: focusing on creating products and services with a longer lifespan and minimizing resource use

Distribution: efficient distribution system to reduce transportation and resource waste

Consumption: encouraging consumers to make more sustainable choices. For instance, avoiding single-use product

Recycle/reuse: this step involves refurbishing or repurposing products for continued use, extending their lifespan

Circular economy works by extending product lifespan through improved design and servicing, and relocating waste from the end of the supply chain to the beginning. As much as possible, everything is reused, remanufactured, recycled back into a raw material, used as a source of energy, or as a last resort, disposed of.

The circular economy is based on three principles:

- 1 Eliminate waste and pollution:** it avoids the design of single-use products and enhance its maintenance, sharing, reparation, among others.
- 2 Circulate products and materials at their highest value:** it involves maintaining materials in circulation, whether as a product or, if they can no longer serve that purpose, as parts or raw materials. This approach ensures that nothing turns into waste, and the inherent value of products and materials is preserved.
- 3 Regenerate nature:** it focuses from resource extraction to resource regeneration, which means the transition to a regenerative model by emulating natural systems.

NARROWING RESOURCE FLOWS

This approach includes: renewable resources, resource efficient and cleaner production, industrial symbiosis and eco-industrial parks, optimised distribution, reduced consumption and Chemical Leasing. Each of these is defined and illustrated below.

Narrowing resource flows: This approach uses fewer resources per product or service. Resource productivity is often treated as an indicator of resource efficiency that is not aimed at the cyclic use of products and materials, but as an approach to reduce resource use within the product and production process.

Note that the boundaries between approaches and strategies were sometimes difficult to define, and that cases may fall under two or more of these.

Renewable resources

Renewable resources (biological materials). Within a circular economy context, materials could derive from bio-based sources. This approach diminishes the need for fossil carbon and promotes the utilization of waste and by-products.

Bio-based materials offer numerous environmental advantages, notably demonstrated by bio-based polylactic acid (PLA), which possesses a carbon footprint four times smaller than petroleum-based polypropylene. In a broader context, a metric tonne of bio-based products generates 0.8 to 3.2 times less CO₂ compared to plastics derived from petroleum sources.



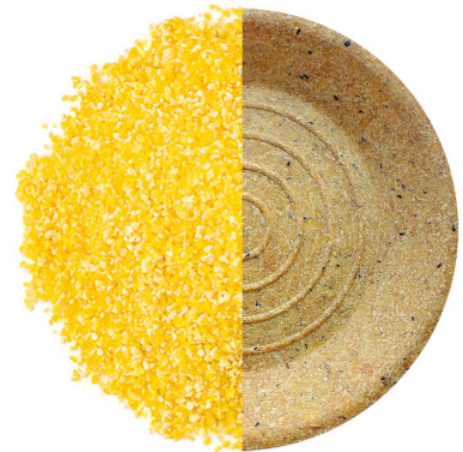
Case 1

BIONUS Production of disposable biodegradable tableware

The company is a manufacturer of an innovative line of biodegradable disposable tableware from natural raw materials. The tableware is made from beet pulp, corn, flax, hemp and soya meal. BIONUS produces up to 10,000 plates or bowls from one tonne of pure vegetable meal.

Benefits of bio-based tableware over plastic tableware:

- ➔ Eco-friendly production and disposal;
- ➔ Takes 30 to 180 days to decompose;
- ➔ Can be used as compost (natural soil fertiliser) once used;
- ➔ Withstands extreme temperatures (-25 to 200°C) - can be used in freezers, ovens and microwaves;
- ➔ Resists deformation and retains its original shape for a long time;
- ➔ Original design and smooth finish.



Case 2

OCHIS Coffee grounds for glassware production

The company produces eyewear and sunglasses from coffee grounds (cake), natural oils and a biopolymer based on vegetable oils used as a binder. The company adheres to the Zero Waste philosophy, which is based on the ideas of zero waste production and resource circularity. Multiple recycling prevents resources from going to landfill.

The whole process of frames manufacturing consists of several stages:

- ➔ Coffee grounds are collected from local coffee shops in Kyiv;
- ➔ The waste is dried and mixed with natural oils to bind it;
- ➔ The material is pressed into sheets and then the frames are cut out on a milling machine;
- ➔ The frames are hand polished to perfection;
- ➔ Original design and smooth finish.

Ochis is a good example of turning seemingly ordinary waste into a valuable and useful material.



Case 3

PARADA Installing and operating a 100kW rooftop solar system

The company belongs to garment sewing industry. It was founded in 1976 as part of the Zakarpattia Sewing Association, and in 1995 it was transformed into the Uzhhorod Garment Factory, PJSC. The company operates on the market under the Parada brand. The factory sells 80% of its products on the European market (England, France, Italy, Germany, and Holland), using tolling raw materials, and the remaining 20% on the domestic market.

Wanting to have its own source of electricity that would not depend on the municipal grid and would provide the company with power regardless of blackouts, the company's management decided to implement a project to build its own rooftop solar power plant. During the spring and summer of 2023, the project was implemented and the factory received its own 100 kW power plant. It was commissioned in August and generated 38,467 kW of electricity within two months. At the same time, CO₂ emissions were reduced by 48 tonnes.

Based on the electricity consumption in the same months of previous years, the installed rooftop power plant reduces electricity consumption from the grid by an average of 70%. In winter, this percentage drops to 40%, and in summer it can rise to 85-90%.



Case 4

GOODVALLEY UKRAINA Installing biogas complexes to convert production waste into clean energy

Goodvalley Ukraina aims to become an environmentally friendly food producer with a carbon-neutral footprint. This is achieved in three steps: growing raw materials for feed on its own fields, breeding animals and producing green energy in its own biogas plants. This means almost zero waste.

The biogas complex, with a capacity of 4.8 million cubic meters of gas, is installed on the farm to produce biogas through anaerobic digestion of animal and plant waste (pig manure, slaughterhouse waste, maize silage, cereal chaff, etc.).

The 1.5 MW CHP unit burns biogas to produce electricity and heat. On average, the company produces 1,166 kW of electricity per year, of which 10-15% is used for own consumption and the rest is sold. This production cycle reduces the negative impact on the environment by reducing greenhouse gas emissions.

Once the biogas has been produced, the waste biomass is used as a unique organic fertiliser on the sown areas, which is more easily absorbed by the cereal crops.

The organisation of the production process described above ensures the sustainability of the pig production and provides both economic and environmental benefits.



Resource efficient and cleaner production

This concept gives companies additional economic benefits and reduces their impact on the environment. 'Produce more, consume less' is the key slogan of this approach.

Resource efficient and cleaner production entails the continuous application of preventive environmental strategies to processes, products and services in order to increase efficiency and reduce risks to humans and the environment.

As part of the Resource Efficient and Cleaner Production (RECP) demonstration project of the EU's Greening Economies in the Eastern Neighbourhood (EaP GREEN) Programme, the Resource Efficient and Cleaner Production Centre has implemented this concept in a number of domestic enterprises, with the aim of accelerating and expanding the use of RECP at national and regional level, followed by the promotion of successful practices (www.recpc.org).

Case 5

OBERBETON By-product production and waste reuse

Oberbeton-Invest is a domestic manufacturer of prefabricated concrete constructions. With European production standards ensured by a full range of modern equipment from leading European companies, the company is one of the largest enterprises in Ukraine.

The variety of products is guaranteed by the availability of a developed technical and production base. The company is equipped with advanced technological equipment, modern management and control facilities. It has testing facilities that meet the strictest requirements for product approval. In particular, there are unique test benches that allow field tests as close to operating conditions as possible, as well as research and experimental work.

The company applies the principles of resource efficient and clean production through:

- ➔ **By-product production:** Increasing sales of cut reinforced concrete. Development of measures to produce by-products, optimisation of slab cutting, and increased sales of cut slabs through improved marketing. The potential for reducing waste generation from reinforced concrete products is 75%, or about 1,011 m³.
- ➔ **Reducing steel wire rope waste:** Developing organisational measures to reduce the length of ropes on stands and the number of ropes in bays to reduce their waste. This will reduce waste by 11 tonnes per year.
- ➔ **Production of less responsible products:** Concrete waste from round hollow core slab moulding and concrete product trimming in the round hollow core slab production area is used to make foundation blocks. The total amount of waste is 4,843 tonnes per year. This means that almost all of this waste is recycled back into production.



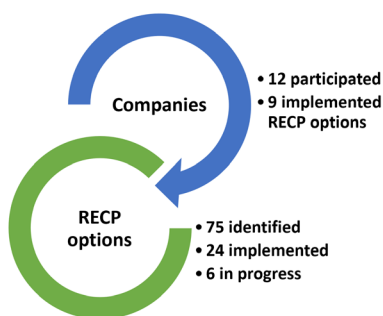
Case 6

Demonstration companies Implementing RECP measures

Twelve manufacturing companies were assessed using the RECP methodology as part of the EU4Environment Action.

The assessed companies represented engineering, light, food, chemicals and construction (8 medium-sized, 2 large and 2 small companies) industries.

Based on the assessment results, a total of 75 RECP measures were developed for 12 companies. 24 of these have been implemented (as of early autumn 2024) and a further six are in the process of implementation. This is confirmed by the RECP Centre’s statistics: At least 30% of the proposed measures are implemented in the first months after the company receives the assessment report. In addition to the proposed measures, companies have implemented new measures of their own design, such as measures to improve working conditions or responsible business practices.

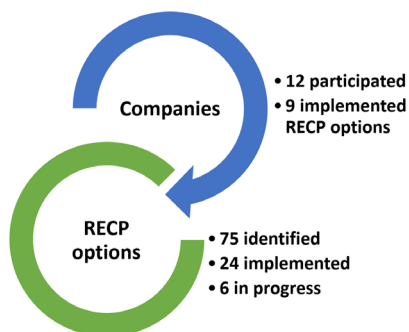


Potential:	Results:
Investment, EUR	
2,220,865	321,396
Savings, EUR/year	
770,479	213,333
Energy, kWh/year	
8,529,895	2,891,904
Water, m³/year	
21,037	300
CO₂-eq. t/year	
2,319	852

The companies received technical assessments and identified RECP measures, training on RECP topics and investment proposals for measures they selected as priorities. Business cases will be sent to them shortly.

RECP Clubs

Clubs have been established in two cities, Poltava and Khmelnytskyi, with 7 companies in each. Seventeen company representatives attended the training and six training modules were held in each region. Each participating company developed an action plan to improve resource efficiency in the company. Technical reports describing resource efficiency improvement options were prepared and presented. A total of 41 RECP measures were proposed, 16 of which were implemented during the monitoring period (early summer 2023).



Potential:	Results:
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Industrial symbiosis and eco-industrial parks

Industrial symbiosis is an initiative of a circular economy that exchanges waste, by-products, water, energy or other resources between enterprises generating competitive advantages.

Eco-industrial parks is a community of businesses located on a common property in which businesses seek to achieve enhanced environmental, economic and social performance through collaboration in managing environmental and resource issues.

Case 7

SORENSEN & KHAAR

Using wood flour to make fuel briquettes and as a material for polishing mink fur

Sorensen & Haar is an affiliate of Denmark-based Concept Partners. Sawmilling and planing and related activities such as furniture production, timber wholesaling and fuel briquette production are the company's core business. The company has been on the market since 1999.



The main manufacturing process also generates by-products such as wood chips and wood residues of various sizes. These by-products are processed (grinded) to produce wood flour with a particle size of 50 microns. The wood meal is then used in two ways: it is delivered to customers in big bags of the appropriate weight or in the form of fuel briquettes. It is mainly used by mink farms to polish furs before cutting fur products. Fuel briquettes are produced directly at the factory. During the cold season, they are used as fuel for solid fuel boilers.

Over the three years of operation (2018-2020), the company's production is 10,543 tonnes of wood flour.

Case 8

TRYPILLIA PACKAGING PLANT Return of production waste (corrugated cardboard) to a cardboard and paper manufacturing plant

The Trypillia Packaging Plant produces corrugated cardboard and corrugated packaging. The company purchases cardboard and paper from paper mills to run its operations.

The production of corrugated cardboard and, in particular, cardboard containers generates a certain amount of paper waste.



The volume of such waste at the enterprise was approximately 20%. They were collected, packed and returned to the paper mill, and in return received new products, cardboard and paper. As a result of such symbiosis, both companies benefited. The first enterprise received raw materials for the production of products, paper and cardboard. The benefit of the second enterprise was the disposal of production waste in the most rational way and reduced costs for production materials.

During the year, the enterprise handed over 7-8,000 tonnes of paper waste to the paper mill and received in return almost 1,000 tonnes of products.

Therefore, there was almost no waste accumulated at the enterprise, which had to be further disposed of. Further implementation of the circular economy model at the enterprise encourages it to use resources as efficiently as possible.

Optimised distribution

Optimised distribution of materials and products is also crucial in the circular economy, as the distance between facilities should be as short as possible.

It is worth mentioning, that the reduction of material flows also starts with the product designer, who designs products in such a way that material inputs are minimised, which can be supported by possibly minimising the transport distances of the chosen resources. As a consequence, import dependencies are reduced, as such dependencies present risks to resource security, and instead promote small, local repair, remanufacturing and recycling flows to avoid products being transported back and forth over long distances.

Case 9

NOVA POSHTA Recycling of packaging, process automation, lean management

The company has a number of standards for identifying and managing environmental issues and risks.

The 3Rs (Reduce, Reuse, Recycle) principle is applied to the choice of packaging to protect parcels during transport. All boxes and paper fillers are made from recycled materials and can be recycled. Used packaging (paper and polyethylene) is collected separately in the Nova Poshta departments and sent for recycling.

In 2022, the company opened an automated terminal in Dnipro, equipped with a two-stage line for sorting parcels, telescopic conveyors that drop parcels directly into the car body, a separate automated line for sorting small parcels, and robotic carts.

The inauguration of this terminal was the impetus for the development of Lean Management (LEAN) within the company, a concept based on the relentless desire to eliminate all forms of waste and implement continuous improvement. LEAN tools such as 5C, Visual Management, Obey's Room, etc. were implemented in the terminal from the very beginning.

LEAN management is also actively implemented in other parts of the company, from regional departments to large sorting centres.



Case 10

YUKA TA PTASHKIN SAD Return system for the reuse of cosmetic containers

YUKA and PTASHKIN SAD are Ukrainian brands of ethical natural cosmetics. Branded products are made from natural ingredients approved by international organic standards, without parabens, SLS and other harmful ingredients. None of the cosmetics produced are tested on animals.

YUKA has gone completely plastic-free and uses eco-friendly packaging for its products, which can now be returned for reuse, while PTASHKIN SAD prefers 90% glass and aluminium containers for reuse.



Both brands accept containers (glass bottles, jars, etc.) in quantities of 10 or more. As a reward for returning the container, buyers receive a discount equal to the cost of the container. But there's a catch - the company doesn't offer a discount if the container was packed in any kind of polyethylene packaging. For safe transport, glass vials must be wrapped in paper or corrugated cardboard and the free space in the box filled with paper or paper filler. This is a way for brands to demonstrate their environmental awareness.



➤➤➤ Reduced consumption

Fostering responsible consumption is paramount in mitigating the environmental impact of products. Central to this effort is the extension of product lifespans, a measure that significantly curtails the overall lifecycle climate and environmental footprint. By prioritizing longevity, consumers diminish the need for frequent new purchases, thereby conserving valuable resources required for manufacturing. It is imperative to design products with enduring appeal or adaptability, fostering a consumer inclination to retain them rather than succumb to trends of disposability.

The aim is to minimise the overall demand for new products and the waste associated with production and disposal.

Reduced purchasing refers to the idea of consuming and purchasing goods and services in a more mindful and restrained manner.

Fit-for-purpose purchasing means purchasing products which fit your real needs rather than products which offer many more services than you actually need: more services means more complex product, which means more environmental footprint in the production stage.



Case 11

RESTRICTING THE USE OF POLYETHYLENE AND OTHER PLASTICS

Nearly 40 countries are currently trying to limit or ban the use of polyethylene and other types of plastic.

On 1 June 2021, the Verkhovna Rada of Ukraine passed a law that will almost completely ban the distribution of certain types of plastic bags in Ukraine.

Such changes in Ukraine will contribute to the achievement of two SDGs:



The polythene bag was introduced to Ukraine only 20 years after its appearance.

During this rather long period of time, the use of avoskas, now called shoppers, has been absolutely normal. That is to say, people are used to using reusable containers.

According to statistics, everyone uses 500 plastic bags annually. On average, they are used for 20 minutes and take between 100 and 400 years to decompose.

Banning free slim bags and introducing biodegradable ones is just getting started. This is only the first step towards a culture of waste management and a circular economy, as Ukrainian consumers, accustomed to plastic consumption, started to buy fewer bags when all bags were paid for. It's worth noting, however, that society seems to be supporting reducing plastic bags.

In the year that minimum retail prices for plastic bags were introduced, Ukrainians reduced their use from 40 to 90% (depending on the type) and more than doubled their use of biodegradable bags.

In 2020/2021, average monthly sales of polyethylene packaging bags in the ATB Market network were almost 30 million. In 2022, they were down 57 per cent.



SLOWING DOWN

Slowing down: Through the design of long-life goods and product life extension (i.e. service loops to extend a product's life, for instance through maintenance, repair) the utilisation period of products is extended, resulting in a slowdown of the flow of resources through the economy.

Approaches such as sharing, reuse, maintenance and repair, and remanufacturing are part of the strategy to slow down flows.

Product sharing

Product sharing presents an opportunity to intensify the usage of products that are underutilized during their lifetime being only used occasionally for a short period.

Businesses play a pivotal role in cultivating a culture of sharing by implementing accessible sharing platforms that cater to diverse segments of the population, thus emphasizing consumer commitment to sustainable practices.

Case 12

BOLT

Use of taxi fleet or partner vehicles for taxi work. Using taxi services

Bolt is a company that provides services for searching, ordering and paying for rides in cars, motorbikes or electric scooters through the mobile application of the same name. Through its platform, Bolt also offers drivers the opportunity to use company cars or their own cars to provide taxi services.

By choosing the closest car location, you can reduce the payment for the service due to lower fuel consumption per trip.

To use the Bolt taxi service, the driver has the option to select the city of work on the company's website and fill out the appropriate form.

Drivers can use either their own car or a company car.

A similar service will be relevant in the cases where:

- ➔ There is no own car;
- ➔ Own car is not in use and the owner has the opportunity and desire to earn additional income;
- ➔ There is no financial possibility to buy a car to work as a taxi driver.



The online platform thus provides drivers with access to Bolt's fleet for taxi work and offers car owners the opportunity to earn additional income by using their cars in the taxi service.

If the driver uses a Bolt company car for taxi work, then all costs for maintenance and roadworthiness testing of the car will be the responsibility of the company. Therefore, the most acceptable option for drivers to work in a taxi when required is to use company cars. This allows to significantly reduce own car maintenance costs.

The online platform is also a tool for the management of micro-mobility in the city:

- ➔ Prevents operators from overloading the road and minimizes costs;
- ➔ Frees up public space by reducing the number of idle electric scooters and bicycles.

The online platform also offers the possibility of renting an electric scooter to get around the city. This mode of transport transforms the urban environment by reducing CO₂ emissions into the atmosphere and reducing traffic congestion.



Case 13

YARMICH Rental services for clothing

YARMICH GROUP started as a Ukrainian men's classic clothing brand. The company has been operating since 2019, and its concept goes far beyond the shop. The YARMICH brand is not just tailoring and selling suits, YARMICH is a real men's space where you can create a gentleman's image, from shoes to hairstyles.

In particular, the YARMICH brand has created a rental service so that everyone can try on a classic look and make sure it is comfortable, beautiful and stylish. The company employs professional stylists to help you choose an image for a wedding, graduation, party, photo shoot or business meeting.

A suit, shirt, shoes, tie or bow tie, belt, watch and cufflinks are included in the set if required. Tailoring and dry-cleaning of the suit are included in the rental price.



Product as service system models offer:

- **Smart consumption:** Renting clothes helps the planet because people do not throw away a suit they have only worn once or twice. If there is no need or habit to wear suits, then the purchase will be unused in the wardrobe, taking up space for other (necessary) things;
- **Saving money:** Renting is cheaper than buying. You can have a less expensive costume and still have a flawless look. Rather than repeating your own images, you can rent different costumes each time.



Case 14 | ZEPPELIN UKRAINE Renting special equipment

Zeppelin Ukraine is an official Caterpillar dealer in Ukraine and a provider of special equipment rental services. In cases when there is an urgent need for a specific machine or the technology is needed periodically to perform certain works, this service is the best option.

Zeppelin Ukraine has been operating in the market for 24 years. It owns a fleet of more than 1,390 units of machinery (construction, road, utility, as well as attachments for various needs), which can be placed at the customer's disposal for use. The offer catalogue is published on the company's official website. Upon prior order, the customer can be provided with equipment not included in the catalogue. According to the conditions, all the equipment is rented for a period of 1 month, its transport to the place of use is organised and regular maintenance is carried out.



By using such a service, the company can reduce the costs associated with the purchase and subsequent maintenance of heavy equipment in cases where its use in the work is temporary and short-term (necessary only for certain types of work). Both large and small companies use this service.



Examples of equipment to be hired and the cost of the service include:

- ➔ Backhoe loader 426F2
- ➔ The rent is EUR 2,600 per month



- ➔ Excavator 320D
- ➔ The rent is EUR 4,800 per month

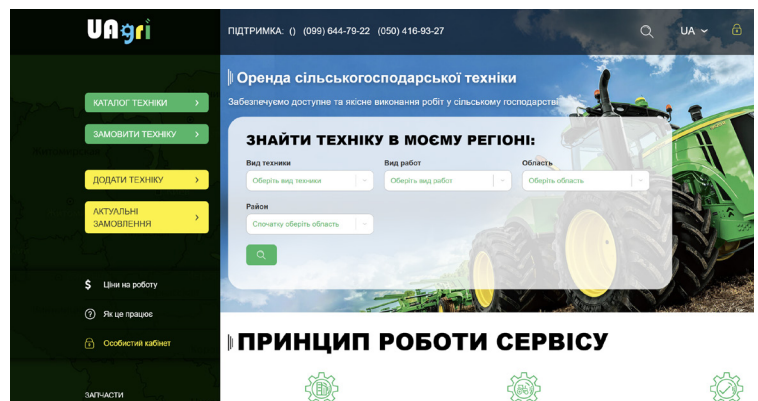
For comparison, the market value of the CAT 320D excavator is EUR 138,000. In addition to the initial purchase cost, there are maintenance and inspection costs. If the equipment is not in constant use, the cost of running it increases and further maintenance becomes impractical. Therefore, if necessary, the most acceptable option for the company is to rent equipment for a certain period to carry out specific work. In this way, it is possible to reduce costs several times over.

Case 15 | UAGRI Rental of agricultural machinery

UAGRI is an online platform for ordering agricultural equipment. This resource allows you to find the equipment you need to carry out any agricultural operation.

On the website, the filtering system allows you to select offers according to parameters:

- ➔ Types of work: harrowing, fertilising, ploughing, deep loosening, drying, cultivating, spraying, sowing, baler, transport work, harvesting;
- ➔ Name of equipment: seeder, harvester, sprayer, seeder, tractor, loader, excavator, compactor, chisel, aeroplane, helicopter, drone;
- ➔ Type of equipment.



The AgTech system filters all offers and provides those that meet the specified parameters. You can contact the owner of the equipment directly via the UAGRI website and agree on cooperation.

A similar service will be relevant in the case when:

- ➔ The equipment is urgently needed (it has broken down or is insufficient to carry out the work);
- ➔ The necessary equipment is not available;
- ➔ The necessary equipment is not in constant use;
- ➔ There is no money or desire to purchase equipment.

The online platform gives farmers access to rental equipment. It also gives equipment owners the opportunity to earn extra income by renting out their equipment.

Case 16

VILOGIC Rental of photocopying and printing equipment

VILOGIC LLC. provides services of selling, leasing, maintenance and repair of office equipment. Printing office equipment is the type of equipment needed here and now.

Situations may arise when it is necessary to print documents or make copies of already existing documents in the required quantity, even if the company has implemented a paperless document flow. In such cases, there is a need for short-term or long-term rental of the necessary office equipment (printers, scanners, copiers and multifunction devices).

This service is also relevant when:

- ➔ The company does not have extra resources and does not wish to spend them on purchasing new equipment or restoring existing equipment;
- ➔ Here is a need to increase the capacity of the office in order to meet ever-increasing demands;
- ➔ It is necessary to temporarily increase the capacity of the printing and photocopying complex during the reception of delegations, partners, working groups;
- ➔ It is necessary to continue the execution of printing and copying works, regardless of the sudden failure of the existing equipment.



The terms of the contract may provide for different terms of service provision:

- ➔ Hourly rental;
- ➔ Daily rental;
- ➔ Long-term rental (month, year).

Consumers of the service can be:

- ➔ Owners and managers of businesses of all types and stages of development;
- ➔ Hotel managers, organisers of conferences, exhibitions and other events;
- ➔ Project and business development managers
- ➔ Students and pupils.

An example of office equipment for rent is the Canon A3 multifunctional. Estimated rental price – EUR 140 per month (10,000 black and white pages and 2,000 colour pages). At the end of the rental period, the price is adjusted according to the number of sheets printed (black and white and colour). The market value of the equipment is EUR 1,630 (www.rozetka.com.ua). If it is only used occasionally, the cost of a printed sheet increases many times over. This does not justify owning or purchasing printing equipment. In such a situation, it is advisable to rent office printing or copying equipment for any period (from one day to one year). This will allow you to reduce printing costs as the rental price includes the equipment itself, support, consumables and spare parts (and paper if necessary). All running costs are included in the rental price.

Reuse

Reuse is the re-use by another consumer of discarded product, which is still in good condition and fulfils its original function.

Reuse involves extending the lifespan of a product by allowing another user, or series of users, to employ it for the same original purpose, with little to no enhancements or alterations. In reuse, use is “in series”: one user after another gets to use the product and each user will (most probably) never use the product again once they have finished using the product (like baby clothes).

Freecycle refers to the object circulation without reward and free from economic means.

It is a type of collaborative activity that has intentions such as preventing consumption, extending the life cycle of the product and decreasing waste.

Case 17

AUTO.RIA Used car sales

The screenshot shows a search interface for used cars. At the top, there are tabs for 'Всі' (All), 'Вживані' (Used), 'Нові' (New), and 'Під пригон' (Imported). A checkbox for 'Перевірений VIN' (Verified VIN) is also present. Below these are several filter dropdowns: 'Легкові' (Sedan), 'Марка' (Brand), 'Модель' (Model), 'Регіон' (Region), 'Рік випуску' (Year of release), and 'Ціна, \$' (Price, \$). At the bottom, there are two buttons: 'Розширений пошук' (Advanced search) and 'Пошук' (Search).

AUTO.RIA is an online platform for the sale of new and used cars. Through a simple search system, you can use filters to select the desired vehicle according to your requirements (make, model, year, price) and familiarise yourself with the proposed options.

For each car, there is information about its price, mileage, type of fuel, engine capacity and information about the seller (name and surname, contact phone number). Potential buyers can then choose from the full range of offers and contact the seller directly to discuss the details of the purchase.

This service enables owners of cars that have been in use for some time to extend their life by selling them to a new buyer. At the same time, people who would like to own a car, but do not have the financial means to do so, can buy a car for less money, but such a car will already have a certain mileage when purchased.

According to the European Business Association, the used car market is more than 10 times larger than the new car market in terms of the number of transactions. In January-June 2023, 375,000 used cars were resold, which is 48% more than in the same period of 2022. In monetary terms, the secondary market is only twice as large. In the first half of 2023, new cars were sold for USD 1 billion and used cars for USD 2 billion, according to AUTO-Consulting.

➤➤ Maintenance and repair

Maintenance/Repair of a product: Both involve preserving or restoring a product's functionalities during its use through minor fixes, so as to extend the lifespan of the product.

Repair is normally a more radical activity, in that the product may well not be able to work anymore unless it is repaired, whereas maintenance is normally done on a still functioning product. These are tasks that can be undertaken by the manufacturer or professional service providers.

Case 18

PIVDENERGO GROUP

Preventive maintenance of transformers with regeneration of transformer lubricant on site

The company Pivdenenergo Group started its activity in 2008.

Main activities are:

- ➔ Supplies of electrical equipment of various types from leading CIS and European manufacturers
- ➔ Production of high voltage disconnectors and those used for railway contact network
- ➔ Consulting on the purchase of necessary products
- ➔ Testing, repair and post-warranty maintenance of equipment.



One of the types of equipment maintenance is preventive maintenance of transformers with regeneration of transformer lubricant on site.

The lifetime of the transformer is the lifetime of the insulation system. The most common insulation system is both liquid (transformer grease) and solid (paper, wood, i.e. cellulose products). Insulating grease provides almost 80% of the electrical strength in a transformer. Transformer lubricants have high insulating properties. When insulating materials are saturated with them, the low viscosity of the lubricant allows it to penetrate the solid insulation and remove heat, transferring it to the cooling system. Stabilising lubricants against oxidation allows them to work at high temperatures and protect the insulation system from serious damage for a long time.

Transformer oil cleaning, including regeneration, is a preventive maintenance tool to extend the life of the transformer. The purpose of preventive maintenance is to remove residual ageing products from solid insulation and lubricants before they damage the transformer insulation system.

The process of regenerating the lubricant and cleaning it of dirt can take place in situ (perhaps directly in the transformer tank). The oil is pumped from the bottom of the tank, heated and passed through the PALL installation. It is then filtered, degassed and dehydrated before returning to the top of the transformer through the expansion tank. The process continues until the lube oil meets standard or other specifications. The oil recovery process uses the heating, adsorption and vacuum (water removal and degassing) method.

The difference between grease regeneration and cleaning is that cleaning cannot remove substances such as acids, aldehydes, ketones, etc. that are dissolved in the grease. Therefore, cleaning cannot change the colour of the lubricant from amber to yellow. At the same time, regeneration also involves cleaning, filtration and dehydration.

Maintaining the transformer with a good quality lubricant will extend its life. Provided the operating conditions are met, this can be extended to 15 years.

Case 19

OIL AND GAS EQUIPMENT PLANT

Service, warranty and post-warranty maintenance of technological equipment

OIL GAS EQUIPMENT FACTORY, LLC. is a modern machine-building enterprise with a developed infrastructure and a closed production cycle, which offers a wide range of services: from development of design documentation to service support of finished products.

The company designs, manufactures, supplies and services equipment for oil and gas production, oil refining, power generation, metallurgy and utilities. With only a few production sites equipped with high-tech equipment, the company offers production and repair of pumping equipment of any complexity.



The company provides warranty and post-warranty support during the operation of the equipment, performs maintenance, repair and reconstruction or modernisation of the equipment during its service life.



Remanufacturing, refurbishing

Remanufacturing means returning a used product or a used major component of a product (called “core” in remanufacturing language) to at least its original state with a warranty that is equivalent to or better than that of a newly manufactured product.

Therefore, the customer thinks that the remanufactured product should be considered the same as a new product. This practice often occurs as a business-to-business activity and is not visible to the general public, it involves the dismantling of a product, restoring and replacing worn or broken parts and testing the individual parts and whole product to ensure that it meets its origin design specifications.

Remanufacturing can reduce resource extraction and waste disposal by up to 80% compared to the manufacture of new products, and the savings in carbon emissions range 23-87% depending on the products.

On the other hand, refurbishing refers to the process by which used products are restored to a defined working condition in form and function. In refurbishing, any parts that are damaged, that have failed, or that are prone to failure may be replaced, but the device’s composition and design are not significantly changed from the original.

Case 20

ICOOLA.UA Apple equipment repair and refurbishment

The ICOOLA.UA Factory Outlet provides repair, refurbish and sales services for Apple equipment. People always want to use equipment of the highest quality. However, in difficult times it has become more and more difficult to buy new equipment of a high quality and, as a consequence, at a high price. The solution was to buy upgraded equipment from the world’s leading manufacturer at a lower cost.

Remanufacturing and refurbishing used iPhones and iPads allows you to reuse them instead of throwing them away. Tens of kilos of e-waste are processed every day, making the most effective contribution to protecting the environment.

In the 8 years of the company’s existence, more than 50,000 devices have been refurbished and 927 tonnes of waste avoided.



An example of a refurbished device is the Apple iPhone 13 Pro Max 256 GB.

- ➔ The cost of a refurbished device is EUR 890.
- ➔ The cost of a new device is EUR 1,080.

Offering this service allows customers to buy quality at a lower cost. The price reduction percentage for each appliance varies depending on the appliance’s original condition. The environmental impact is to reduce the amount of electronic waste by reusing goods.

Case 21

MYKOLAIVELECTROTRANS Modernisation of tram cars

The Mykolaivelectrotrans Utility is a large company, founded in 1967, which provides services in the field of public ground electric transport.

The company's rolling stock has a relatively long service life, which makes it necessary to replace it. Due to the high cost of new rolling stock and limited funds, the company developed technical conditions and modernised KTM5 tram cars. Before the war began, the company thoroughly modernised one car, after the war - another, and the third is currently only partially modernised (lowering the floor level only in the rear part of the car).

The comprehensive modernisation of the KTM5 car includes the overhaul of the car frame with partial lowering of the floor, replacement of the external and internal electrical systems, but does not include the modernisation of the traction systems. The refurbishment will extend the life of the wagon for another 10 years.



Modernisation offers the following advantages:

- ➔ The lowered floor level allows citizens with limited mobility to use the car
- ➔ The air conditioning system of the cabin and the driver's workplace creates more comfortable conditions for passengers and the driver
- ➔ Replacement of the external and internal lighting systems together with the installation of video surveillance systems increases the safety of using the car, especially when it moves in the reverse direction.

Modernisation of wagons allows to save a lot of money. The cost of a new wagon with a partially lowered floor produced by "Tatra-Yug" is about UAH 32 million. The cost of complex modernisation is up to UAH 8 million. Therefore, modernisation allows you to save the difference, i.e. up to UAH 24 million per car. The scaling up of the modernisation process using the developed technical specifications is a vivid example of the application of the principles of circular economy, considering that there are 25 KTM5 wagons in the fleet of KP "Mykolaivelectrotrans" and almost 400 wagons are in use in Ukraine.

KP "Mykolaivelectrotrans" plans to continue modernising at least its own KTM5 wagons.

CLOSING LOOPS

Closing loops: Through recycling, the loop between post-use and production is close, resulting in a circular flow of resources. This approach maximises the efficiency of resource use by minimizing waste and continuously recycling materials.

» Segregation

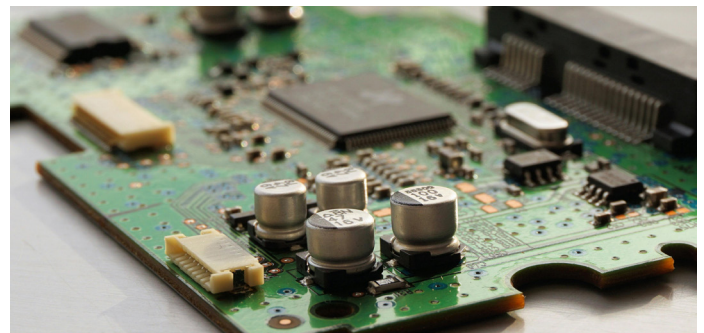
Segregation means the activity of separating the discarded products generated at home, office or from different activities according to the composition.

For instance, grouping recyclable wastes like paper, plastics, glass, aluminium cans, iron, metal respectively from general wastes like dirt and food waste.

Case 22

SKUPKA REK Recycling electronic waste by separating metals

In the 1970s and 1980s, the mass production of radio components for various purposes led to a large number of such products accumulating in manufacturers' warehouses. It is true that the mass enthusiasm for home-made radio electronics at the end of the last century allowed these stocks to be depleted somewhat. For the most part, however, surplus radio parts became unnecessary junk, piling up in warehouses or simply dumped in landfill sites.



Skupka REK is a company that disposes of electronic waste by means of mechanical processing of radio parts and cables and the use of an electrostatic (corona) separator, separating the following materials:

- ➔ Electronic scrap for various conductive metals such as copper, nickel, bronze and other precious metals;
- ➔ A mixture of metals with plastic, e.g. Separating the cable into conductive (metal) and non-conductive (plastic, rubber) parts;
- ➔ Any other mixture containing conductive material.

The line for mechanical processing of radio and cable circuit boards can process up to 300 kg of waste per hour.

The company has been processing electronic waste for over 10 years, purchasing unlimited quantities from individuals and legal entities throughout Ukraine.

Thus, using this technology, Skupka REK processes electronic waste with the separation of metals, which are subsequently used as raw materials for the production of metal products.

Collect

Reverse supply chains play an important role in closing material loops, they are necessary to collect end-of-life products, to channel them to recovery facilities for sorting and processing and to redistribute products and materials for a second life.

An important feature of these reverse supply chains is that these products are collected at different stages in the value chain, as waste, as end-of-life products or materials or as products still being consumed.

Case 23

ECOINTEL Collection and disposal of used fats and waste

Ecointel, LLC. is a licensed company engaged in the environmentally clean, safe and affordable disposal of hazardous waste generated by its own activities. Since 2015, Ecointel has been collecting and processing used lubricants (oils) and disposing of the waste generated. The company has all the necessary equipment to provide these services. Disposal of used lubricants (oils) is their recovery for reuse. There are many Ukrainian and foreign brands of modern lubricants for motor vehicles, special equipment, agriculture and industry on the market, and their consumption is increasing every year. Therefore, the timely disposal of used oils is very important for the protection of the environment and human health.

After use, the oil can be collected, disposed of and reused many times. Options for reuse can vary: regenerated lubricant can be used as ordinary motor oil, or same regenerated oil can be used as fuel oil. Some fluids can even be filtered on site and recycled.

On-site recovery involves the removal of contaminants from the used lubricant and its reuse. Although this form of disposal does not restore the oil to its original state, it does extend its shelf life.

When transported to an oil refinery, spent oil is used as a raw material in the initial stage of the process or as a coker for the production of gasoline and coke.

Regeneration is the process of treating used oil to remove contaminants so that it can be reused as a base for a new lubricant. Regeneration can extend the life of the lubricant almost indefinitely. This form of recycling is preferable because it closes the loop by reusing the oil to make the same product that the waste oil originally was, saving both energy and natural resources.

The refining and combustion of waste oil for energy generation presupposes the removal of water and various additives so that the waste oil can be used as a fuel to generate heat or electricity for manufacturing processes. This type of recycling is not as attractive as material reuse methods, as the waste oil can only be used once.



Recycle

Recycling is defined as any reprocessing in a production process of material embedded in end-of-life products, to recover those materials and allow them to be reused to make new products of the same or similar value as the original products from which the materials came.

Recycling is defined as any reprocessing of material in a production process that diverts it from the waste stream, except use as fuel, since the materials are destroyed in the burning process and can no longer be used.

Case 24 | ZMIIVSKA PAPER MILL Tetra Pak packaging recycling

Zmiivska Paper Mill is the only one in Ukraine to process Tetra Pak packaging, which consists of paper, polyethylene and film. If left untreated in a landfill, it can decompose for hundreds of years.

During processing, the milk or juice carton is broken down into fibres, from which packaging types such as paper, kraft paper, newsprint, etc. are produced. This is the first complete recycling cycle of all components of combined cardboard packaging at one industrial site in Ukraine, bringing the national waste management industry closer to European Union standards.



The plant has the capacity to process up to 500 tonnes of packaging per month.

The plant's long-term partner is the Ranok Publishing House. Half of its products are printed on recycled paper made from such packaging.

In addition to paper, the mill can produce more than 4,000 tonnes of high-quality polyaluminium granulate. It is used for the production of various products and as an additive in the production of polymer sand products (paving stones, manhole covers, gutters) and road surfaces. Secondary polyaluminium granulate products can be recycled.

Case 25

DOBROBUT UTILITY COMPANY

Paving slabs made from crushed polyethylene bags mixed with sand

Dobrobut Utilities is a modern waste sorting complex located on the territory of the Illinetska Amalgamated Territorial Community (ATC). The company contributes to the improvement of the solid waste management system through the intermediate stage of collection and sorting of used plastic, paper, glass and other solid waste. 60% of the imported waste, divided into 14 fractions, is sorted. Waste sorting and collection of plastic containers within the city of Illintsi is carried out at 50 locations.



The company uses a unique technology to produce paving stones from a mixture of crushed polyethylene bags and sand. In 1.5 years, 110 tonnes of polyethylene bags have been processed.

Every day 20 to 30 square meters of paving stones are produced and it is used only on the territory of Illinetska ATC.

The work of the waste sorting complex helps to reduce the accumulation of waste in the territory of Illinetska ATC. The production of paving slabs from waste with a lower estimated cost and using local materials provides the municipality with cheaper material for improving the town area. Dobrobut shows that waste management can be solved at the local level.

Case 26

SEM ECOPACK

Producing environmentally friendly packaging

Sem Ecopack is a manufacturer of environmentally friendly packaging. The company offers a wide range of moulded cellulose packaging for different types of products such as fruit, vegetables, bottles, eggs, cups, etc.

In its day-to-day activities, Sem Ecopack is guided by the principles of ESG (Environmental, Social and Governance) and the circular economy. The company takes into account the entire life cycle of the product, all the way from development and production to recycling. In addition, the company's research has shown that moulded cellulose packaging has a significantly lower carbon footprint than plastic packaging.



Depending on customer requirements, both primary and secondary fibres can be used in the manufacture of products. However, the basis of production is a secondary raw material, namely pulpboard.



Pulpboard is a unique environmentally friendly material. It is produced by forming waste paper pulp (mixture) under pressure. Waste paper pulp consists of paper pulp obtained by recycling secondary raw materials. Pulpboard can withstand 30 to 60 recycling cycles. The company's philosophy is a careful approach to the earth's resources, a conscious responsibility towards the planet, and therefore previously used materials, including its own products (packaging materials of its own production, returned by the user) form its own material base.

Pulpboard packaging is much stronger than plastic packaging and helps to maintain the shape and quality of products during transport. Its absorbent properties prevent the formation of mould and condensation inside the egg carton. The air that passes through the packaging helps to keep the product fresher for longer.

Case 27

PDM-PLAST

Production of polymer-sand products containing recycled polyethylene

PDM-PLAST, LLC. is a small company producing polymer-sand products, paving slabs and roof tiles. It was established in 2021. The total production capacity is up to 40 square metres of paving slabs per shift.

Unlike the traditional production technology of similar products, polymer-sand products replace the binder (cement) and filler (crushed stone) with recycled polyethylene. The bricks and tiles produced using this technology have much higher mechanical strength and abrasion resistance and lower hygroscopicity, which are advantages over traditional technology.



Once in a landfill, polyethylene decomposes for hundreds of years, but with this technology, this disadvantage becomes an advantage for polymer-sand products. Today's production capacity allows the use of up to 3 tonnes of polyethylene per month, which, taking into account the seasonal nature of product demand, will allow the company to avoid landfilling almost 30 tonnes of polyethylene waste in 2023. Recycled polyethylene waste is purchased on a commercial basis.

In 2023, used polyethylene waste (as a binding component) replaced around 45 tonnes of cement (whose production has a significant impact on the environment).

The use of recycled polyethylene as a raw material ultimately makes the company's products more expensive than those made using traditional technology. The average difference between the technologies is almost 50%, but the use of polymer-sand products is economically justified due to the longer service life of the products while maintaining an attractive appearance. The products are sold based on feedback from customers who have already purchased such products and shared their impressions with their friends. The trademark for the company's products is under development and design. The company is based on the Chernihiv Union of the Blind. Of the four employees, two are visually impaired.

Case 28

BODNARIVKA Recycling of mercury-containing equipment

The state-owned enterprise Bodnarivka is located in the city of Lviv and is a subsidiary of Zelenyi Lviv Utilities. The company's main activity is the recycling of mercury-containing equipment, such as spent batteries, compact size energy-saving and tubular fluorescent lamps, mercury medical thermometers that have failed and are not suitable for further use. The company operates on a zero waste closed-loop basis. The recycling services of the above-mentioned equipment are provided to different businesses: free of charge for the population and on a paid basis for companies.



Proper disposal of equipment containing mercury minimises the likelihood of mercury or its vapours entering the environment. Mercury is a Class 1 (highest) hazardous substance. 1 gram of this substance can pollute 3.3 million cubic metres of air or 200,000 cubic metres of water. Human poisoning by mercury and its mixtures with phosphors (contained in fluorescent lamps) can cause a number of diseases. Metal vapours accumulate in the human body and pose a major threat to the central nervous system, kidneys, lungs and liver.

The waste processing line was launched thanks to participation in a European Union grant programme, with part of the costs also covered by the Lviv Municipality. The plant started full operation in 2016 after receiving a licence issued by the Ministry of Ecology and Natural Resources of Ukraine for the disposal of mercury-containing waste. During the entire period of full operation, 2.5 million fluorescent lamps and 35,000 mercury thermometers were disposed of.

The company's activities contribute to preventing the environmental disaster, which can occur in case of mercury contaminating soil and water when damaged products are landfilled.



Regenerate

Regenerate refers to regenerating and restoring natural capital, where safeguarding, restoring and increasing the resilience of ecosystem are prioritized. Returning biological resources to nature also falls into this category, through composting for example.

Case 29 | LVIV COMPOSTING STATION Processing food waste into fertiliser

The Lviv Composting Station started operations in June 2020. It is the first such station in Ukraine and the first system of centralised collection and processing of organic waste. The final product is compost (fertiliser) that is completely ready for use.

Typically, compost production involves the conversion of organic material of plant and animal origin into humus, which takes place in compost heaps or pits. Most composting facilities are located near farms that supply raw materials.

In the case of the composting station in Lviv, the raw material is food waste from citizens and businesses, as well as branches and fallen leaves collected by the utility companies. Rather than being dumped in landfills, where it can have a negative impact on the environment, this type of urban waste is transformed into compost.

Compost production takes 2-3 months, during which time food and garden waste are combined, periodically mixed with the help of aerators, moistened and shredded, beneficial microbiophytobacteria are added and saturated with oxygen. At the end of the cycle, the finished compost is collected and sifted.

The main consumers of the finished compost are local farms and agricultural enterprises, which use it to improve the quality of the soil and have already appreciated its beneficial properties.

The sale of the first batch of Lviv compost in April brought in UAH 15,450. This money was used to purchase oxygen for Lviv hospitals.

39,220 kg of Christmas trees were brought to the composting station in January-February 2022. These are the Christmas trees that residents brought to special collection points after the holidays. All of them were turned into fertiliser.

The properties of the compost produced meet all the requirements for this type of product. Its cost is lower than if the raw material were agricultural products, which have to be purchased in advance from suppliers.



DESIGN

Circular design focuses on curtailing a value loss embedded in these products and materials by keeping them circulating in close loops. There are four circular design models: design for longevity, design for service (including design for efficiency during use), design for reuse in manufacture and design for material recovery.

Ecodesign is any form of design that minimises environmentally destructive impacts of a product, this activity identifies environmental aspects of a product and then integrates them into the product design process in the early stage of its development process.

Case 30

VETROPACK – GOSTOMEL GLASS FACTORY Producing a new generation of returnable glass bottles

Glass is one of the most sustainable and environmentally friendly packaging materials. It is made from natural ingredients, does not emit harmful substances and is fully recyclable.

The weaknesses of glass containers are weight and strength. Vetropack was the first in the world to develop a solution that largely eliminates these drawbacks and simultaneously increases the environmental friendliness of glass containers.

Echovai is a particularly durable and economical form of lightweight glass bottle. Echovai bottles are an excellent economic and environmental solution that could revolutionise the market for returnable glass containers.

Reducing the weight of the bottles (by around 30%) is a key factor in saving money, especially during transport. The introduction of this technology has an extremely positive impact on the logistical costs of transport, especially for the beer that the brewery bottles in Echovai bottles, with a reduction of around 1,000 tonnes per year and a reduction in CO₂ emissions per bottle of 25%.

Another advantage of Echovai is that the bottles break much less often because they are stronger and more resistant to wear on the contact surfaces. After three years of use, or twelve circulation cycles, most Echovai bottles can still be considered new. This makes them a more environmentally friendly solution than standard bottles.



Case 31

BLOCKMODULE Modular building production

BlockModule produces modular construction facilities: modular prefabricated houses, offices, buildings, sanitary blocks, trade pavilions, dormitories and hotels, construction trailers, agro-industrial complexes, modular cities, etc. Today, modular buildings are an opportunity to get a completely finished building quickly and cheaply, with the right quality and comfort. The high speed of construction, low price and the possibility of further moving to a new place ensure the growing popularity of modular frame buildings in Europe and Ukraine.



Block container buildings have an extremely low cost per square metre of finished building, starting at USD 200.

The metal frame of block containers is resistant to repeated transport.

Modular shops, commercial real estate and industrial premises can be easily dismantled, transported and reassembled at a new location.

Production and delivery of prefabricated block module buildings takes 1-2 months, with on-site installation taking 1-2 days.

For large numbers of tourists, workers, refugees or the wounded, a block hostel, hotel, hospital or social housing can be built quickly.

Thanks to its modularity, a residential building for up to 100 people can be assembled and installed in just 2-3 months.



The cost of prefabricated hotels and dormitories is 2-3 times less than their capital counterparts. After use, the block containers are dismantled and stored in a warehouse until the next use.

The configuration of the buildings is determined by the needs and size of the block modules used. Due to their standardised design, the buildings can be extended or reconfigured as required.



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