

## Ukrainian National Waste Management Strategy

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In the current conditions, the problem of production and consumption waste accumulation is one of the leading threats to environmental safety. These days, the volume of waste generation, including chemically hazardous substances, is growing in Ukraine, and the area of unauthorized landfills is significantly expanding.

To solve this problem, in 2017, the Cabinet of Ministers of Ukraine approved the National Waste Management Strategy in Ukraine until 2030. Amongst other things, the strategy envisages establishment of regional waste disposal centers, introduction of circular economy principles and extended manufacturer's liability to encourage businesses to minimize waste generation and get interested in waste recycling, as well as establishment of the 5-step waste management hierarchy introduced in the European Union. First of all, this means waste prevention and only in some cases – waste disposal. Local self-governing authorities of Ukraine are obliged to create a system of recycling points for certain products, such as household appliances, furniture, and clothing.

The priority for the agricultural waste treatment should be the conversion of waste into energy, feed and other resources. All this requires extensive technological modernization.

The high level of waste generation and low rates of its use as secondary raw materials have led to the situation where significant volumes of solid waste from the industrial and municipal sectors accumulate in Ukraine yearly, and only a small part of waste is used as secondary raw

materials, the rest ends up in landfills.

Compared to other developed countries, the waste situation difference in Ukraine consists in the large volumes of waste generation and lack of infrastructure for waste handling.

Note! Waste management projects can be implemented under the framework of investment projects with significant investments, which entitles investors to a range of benefits.

In general, the waste management system in Ukraine is defined by the following trends:

- accumulation of waste both in the industrial and domestic sectors, having an adverse effect on the environment and human health;
- improper treatment and disposal of hazardous waste;
- storing household waste without taking into account possible hazardous consequences;
- improper use of waste as secondary raw materials.

Solving this problem is crucial for energy and resource independence of the country, saving natural material and energy resources.

The strategy defines the main directions of state regulation in the field of waste management for the coming decades, taking into account the European approaches to the waste management, laid down in the following Directives:

- Directive 2008/98/EC of the European Parliament and of the Council of 19 November 2008 on waste, repealing certain Directives;
- Directive 1999/31/EC of 26 April 1999 on the landfill of waste;
- Directive 2006/21/EC of the European Parliament and of the Council of 15 March 2006 on the management of waste from extractive industries, amending Directive 2004/35/EC;
- Directive 94/62/EC of the European Parliament and of the Council of 20 December 1994 on packaging and packaging waste;
- Directive 2012/19/EU of the European Parliament and of the Council of 4 July 2012 on waste electrical and electronic equipment (WEEE);
- Directive 2006/66/EC of the European Parliament and of the Council of 6 September 2006 on batteries and accumulators and waste batteries and accumulators.

Currently, the second stage of the National Waste Management Strategy is under way in Ukraine. Its first stage was implemented in 2017-2018, the second one is intended for 2019-2023, and the third one – for 2024-2030.

Implementation of the document into practice should help ensure recycling of at least 15% of household waste through commissioning of waste sorting lines and waste processing plants by 2023, as well as increasing the share of the population that collects household waste separately, at least up to 23%. By 2030, these figures should increase to 50% and 48%, respectively. In this regard, 250-300 new waste reception/collection centers and 90 waste sorting lines should be arranged in Ukraine. The number of landfills should be reduced from about 5500 to 100-150 that will not be just "garbage dumps", but safe modern facilities that meet EU standards.

Nowadays, only one of the four incinerators built in Soviet times operates in Ukraine – the Kyiv Waste Incineration Plant with a capacity of 300,000 tons per year and only one recycling plant is under construction. On 22 October 2020, the European Bank for Reconstruction and Development approved the consortium of companies WTT Netherlands BV – Axis Industries UAB (Netherlands, Lithuania) as the general contractor for the construction of a mechanical-biological waste processing complex in Lviv. Besides that, there are two mobile incinerators in Kharkiv and one stationary incinerator in the Kharkiv region. There are 21 waste sorting lines in different cities.

### **Household and industrial waste**

The problem of solid household waste, the volume of which is constantly increasing, is quite relevant for Ukraine today.

In 2019, the volume of solid waste generation in Ukraine amounted to almost 11.86 million tons, i.e. 280.5 kg per capita. Only about 78% of Ukraine's population is provided with waste disposal services. The prevailing method of household waste treatment is its removal and disposal in landfills and dumping grounds.

According to the State Statistics Service of Ukraine, in 2019, only 0.14% of waste was recycled and 1.7% was burned for energy, and the rest was disposed of in landfills and dumps.

Currently, there are 5,470 landfills and dumps in Ukraine, of which 305 (5.6%) are overloaded and 1,646 (30%) do not meet environmental safety standards. According to expert estimates, over 99% of the operating landfills do not comply with the European standards.

Accumulation of waste in landfills and dumps leads to pollution of the atmosphere, soils, groundwater and surface water, affects the functioning of ecosystems, harms agriculture, and gas emissions contribute to climate change.

Due to the imperfect waste management system, 26.6 thousand unauthorized landfills with an area of 0.75 thousand hectares are revealed annually in the private sector, 26 thousand of which with an area of 0.68 thousand hectares have been liquidated in recent years. The drawbacks of the household waste separate collection system lead to the loss of millions of tons of valuable materials contained in waste.

## **Hazardous waste**

At the moment, the number of hazardous waste types and their volumes have increased significantly due to waste electrical and electronic equipment, batteries and accumulators, chlorine-containing polymers, steroid and biological chemical plant protection products, growth stimulants, preservatives, food additives, etc.

The total volume of hazardous waste accumulation is 5.1 billion tons, and the current costs of its disposal and storage amount to approx. UAH 650 million.

A special group of hazardous waste includes obsolete and prohibited for use chemical plant protection products. According to the official data, their balance at the beginning of 2019 was about 8.7 thousand tons.

In terms of generation volumes, there prevail hazardous wastes, containing heavy metals (chrome, lead, nickel, cadmium, mercury).

In Ukraine, there are about 300 hazardous waste storage facilities, built without proper technical protection, having become a source of environmental hazards of regional importance. There are only a few undertakings, having equipped storage facilities for storing, disposing of and regenerating hazardous waste.

## **Agricultural waste**

The agricultural production intensification and the agricultural land expansion have resulted in an increase in the amount of waste and its impact on the environment.

Traditionally, agricultural waste in Ukraine is divided into livestock waste, crop residue and agrochemical waste.

According to statistical surveys data, the most common types of agricultural waste generated in 2019 (over 14 million tons in total) include:

- waste of vegetable origin;
- animal excrements, urea and manure;
- waste of animal origin and mixed food waste.

However, statistics does not accurately reflect the current situation. For example, where the gross grain yield is 50 million tons, there may be generated up to 25 million tons of straw. In case of an increase in the gross grain yield up to 80 million tons, the volume of straw grows up to

40 million tons, respectively.

Another source of agricultural waste generation is livestock and poultry farming, where the main type of agricultural waste is manure. As of 1 January 2020, the total livestock population in Ukraine is about 3.14 million heads which is 5.7% less than on 1 January 2019. There were 5.73 million pigs in Ukraine (4.9% less than on 1 January 2019). Also on 1 January this year, there were about 1.21 million sheep and goats (4.7% less than a year earlier).

If on average one animal produces 10 kilograms of manure per day, up to 50 million tons of manure can be produced in a year. 1.5 million hens produce over 100 tons of chicken manure per day. About 500 thousand tons of poultry manure is annually produced in Ukraine. In addition, there is also waste from poultry slaughter and mortality. According to the regulations, the mortality may be 3.5 percent of the total number per year, which – in case the average bird weight is 500 grams – is 3,570 tons of biological waste, without taking into account the biological waste, generated during slaughter of poultry.

Another urgent issue is handling chemical plant protection products, which include pesticides, herbicides, fungicides, chemical and biological plant growth stimulants.

A separate group of waste chemical plant protection products is formed by obsolete and forbidden for use pesticides, manufactured and accumulated in the times of the USSR.

At the same time, the results of the inventory of waste chemical plant protection products do not allow to estimate their amount thoroughly. However, preliminary results show that the accumulation of obsolete chemical plant protection products may reach 8.5 thousand tons.

### **Specific types of waste**

The current situation in Ukraine with packaging waste management is unsatisfactory, particularly in terms of ensuring waste collection, recycling and utilization, as well as return into economic circulation.

In 2019, about 6.1% of packaging waste was recycled and disposed of, whereby 2% was incinerated and only 4.1% was sent to recycling facilities as secondary raw materials.

The lack of an efficient packaging waste collection system results in losing significant resource potential for the processing industry in the form of waste paper and cardboard from 0.5 to 0.6 million tons, glass – 1 million tons, polymers – 0.6 million tons every year.

## Waste sorting

From 1 January 2018, following the Law of Ukraine "On Waste", the disposal of unprocessed household waste at landfills is prohibited, and Ukrainians must sort waste and dispose of it in appropriate containers. In the same year, it was decided to close garbage chutes in multi-story residential buildings, and relevant changes to the State Construction Standards were made: the mandatory design of a garbage chute for new construction and reconstruction of buildings was abolished.

Laws and new containers should help reduce the amount of waste disposed of annually from 95% (2016) to 30% (2030) in 14 years, but by 2019 it was reduced by only 1.2%. According to experts, the reason is not just the unwillingness of most Ukrainians to sort waste – unofficial data shows that this is done by about 4% of the country's population – but also the fact that Ukraine still lacks the necessary infrastructure: waste recycling plants, relevant waste containers installed near the houses, and so on. Therefore, waste is mostly sorted by concerned enthusiasts who are willing to spend time and resources to recycle it.