

2022

Executive Summary

Industrial Waste Mapping in Pilot Areas
Amalgamated Territorial Communities of
Davydiv and Slavuta
Ukraine



Action implemented by:

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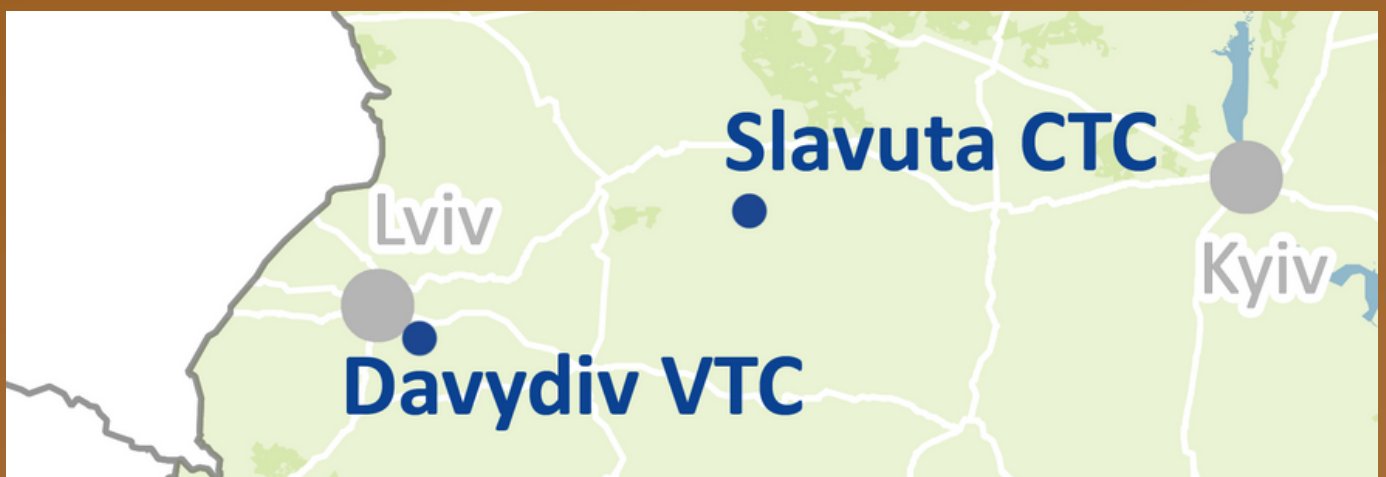
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Foreword

Waste mapping is a common method used to quantify and demonstrate the distribution and management of waste within a geographic area. The overall objective of industrial waste mapping is to identify, assess, and map the waste streams of manufacturing enterprises in order to develop options for improved resource efficiency. This includes the analysis of the collection, transport, treatment and disposal of waste, together with the monitoring and regulation of the waste management process and waste-related laws, technologies, and economic mechanisms. An efficient waste management system creates increased business value for any manufacturing enterprise. This contributes to the sustainability of industries and the promotion of economic opportunities.

The initiative on Industrial Waste Mapping in Pilot Areas was developed under the regional programme funded by the European Union, the EU4Environment Action. It is the result of a collaboration between team members from the United Nations Industrial Development Organization (UNIDO), an international expert team from SWECO AB consultancy, and the Resource Efficient and Cleaner Production Centre (RECP Centre) in Ukraine in its role as a National Implementing Partner of UNIDO for the EU4Environment programme. The full report on industrial waste mapping in Ukraine consists of 13 chapters, which provide an in-depth survey of how industrial waste is handled in Davydiv Village Territorial Community (VTC) and Slavuta City Territorial Community (CTC).

About the study

Industrial waste mapping (IWM) in Ukraine was carried out in two Amalgamated Territorial Communities (ATCs). For the purpose of the IWM pilot exercise, invitations were sent to over 100 ATCs (recently established self-governing administrative units). 17 ATCs submitted their applications, out of which seven were preselected and two were chosen. In comparison to the previous municipality-based administrative model, the decision to work with the ATCs was supported by the close relationship established between the new community administrations and the business sector. This report provides information on the characteristics of the pilot areas, identifies lessons learned, and makes recommendations on how to enhance the capacity and circularity of waste management systems in Ukraine's ATCs.

IWM methodology

The study was carried out in the two pilot regions within the new decentralized administrative system set up in Ukraine. The analysis of waste was carried out on those industries generating types of waste with the highest potential for circularity. Waste data were obtained by sending out forms to relevant enterprises. To increase participation, visits to individual enterprises were conducted by representatives from the Resource Efficient and Cleaner Production (RECP) Centre in Ukraine.

The mapping of wastes focused on their complete waste journey from generation to the final known destination. The mapping included quantities, transportation, destination, key stakeholders, collection costs and post-treatment market value. Alternatives for handling the generated waste were analyzed using the waste management hierarchy framework, from prevention (as a top priority) down to disposal.

Legislative, regulatory, and strategic context

In 2019, the Government of Ukraine approved the National Waste Management Plan until 2030. It sets out a roadmap for the establishment of a waste management regulatory framework based on European Union (EU) standards and frameworks by building on the country's efforts from recent years to meet environmental goals and align its waste management with the EU Directives. In line with the Plan, draft legislation is currently under development on secondary resources, landfill, incineration, municipal solid waste, packaging, waste oil, decommissioned vehicles, batteries and accumulators, and electrical waste and electronic equipment.

Extended Producer Responsibility (EPR), not currently in force in Ukraine, will be introduced under the Plan, facilitated by a new "Law on Waste Management" that includes producer responsibility for certain products. This goes in line with the work of UNEP under the EU4Environment programme to provide a roadmap with key steps and elements to establish an EPR system for packaging waste in Ukraine based on EPR applications in the EU. The national legislation, which was approved in June 2022 and comes into force in July 2023, will also create a waste management hierarchy framework and introduce long-term waste management planning. In addition, it envisages the establishment of a waste management information system based on registries for producers and owners of wastes, along with tighter requirements for licensing the collection and processing of hazardous wastes.¹

Pilot areas: industrial base, main sectors, and waste management system

Both of the selected ATCs, Davydiv Village Territorial Community (VTC) and Slavuta City Territorial Community (CTC), are located in western Ukraine.

Slavuta CTC occupies an area of 69 sq km and has a population of 36,000 inhabitants. The majority of its industrial businesses are involved in the production of bathroom furniture and sanitary porcelain. In total, 21 enterprises were in operation in Slavuta CTC at the time of the waste mapping, 11 of which were included in the exercise. The ATC has launched an initiative to sort and weigh municipal waste at 137 locations across the community area. It was assumed that the enterprises here also use the same collection bins. Slavuta CTC is involved in ongoing discussions with the enterprises supplying solutions for waste recycling to find ways to boost the recycling of separated waste. There is currently no incineration facility due to a lack of financing.

Slavuta CTC



21 * (11 included in the IWM pilot exercise)
manufacturing enterprises



69 sq km
36,000 inhabitants

Davydiv VTC



25 * (14 included in the IWM pilot exercise)
manufacturing enterprises



23 sq km
20,000 inhabitants

Davydiv VTC occupies an area of around 23 sq km and has a population of approximately 20,000 people. It is part of the Lviv district, which is home to a large number of warehouses and logistic enterprises, as well as several manufacturing and agrarian enterprises. In total, there are 25 production enterprises within Davydiv VTC. There are no formal records of waste generation in this area. Currently, there is also no landfill in the territory, which means all wastes are sent to other areas.

¹ Source: www.eu4environment.org.

The only active incineration plant in Ukraine today is located in Kyiv, 550 km from Davydiv VTC and 300 km from Slavuta CTC. The plant was built in 1987 and produces heat. As part of a national strategy to build more incineration plants, a mechanical-biological treatment plant is underway in Lviv, which was intended to be both a sorting facility and an incineration plant.

Datasets

In the data collection process, six out of 21 enterprises in Slavuta that were not considered relevant for the waste mapping exercise have been discarded. This left the waste mapping exercise with 15 relevant industrial enterprises (including producers of bathroom furniture, ceramics, food, beverages, and machine building businesses), out of which 11 chose to take part in the exercise. The broad range of companies located in the ATC and their associated waste were included in the mapping exercise. In the case of furniture companies, it is likely that the waste generated from this specific industry may have a larger potential than observed by the exercise as two large producers did not provide information.

In Davydiv VTC, the waste mapping exercise is likely to provide an overview of about half of the industrial waste generated as it includes data from 10 out of 14 active production enterprises, including large companies. The enterprises not providing data are from a wide range of industries, which means that there is little risk that any major industrial waste category is missing from the mapping exercise.

Waste selection

It was decided that three to four waste streams should be selected per ATC. The decision to include certain waste streams in the study took into consideration both the quantity and the potential for greater circularity.



In Slavuta CTC, the following waste types were taken forward:

- Ceramics
- Paper and cardboard
- Wood
- Plastic



In Davydiv VTC, the following waste types were taken forward:

- Organic
- Paper and cardboard
- Wood
- Plastic



Results

Opportunities and solutions to move towards more circular waste flows were identified for each material, together with the quantification of the financial and environmental potential.

Davydiv VTC

In Davydiv VTC, the improvement of the waste management sample showed that the greatest environmental potential is the prevention of duct tape waste, which, if implemented, could avoid up to 18 metric tonnes of CO₂ equivalent per year. In terms of economic potential, the introduction of pellet production from wood waste offers the highest opportunity for success, with the enterprises in the waste mapping exercise estimating to earn €817 per year in new income from selling by-products from pellet production. Extrapolating from all enterprises in Davydiv VTC that are generating wood waste, it is assumed that this benefit would amount to €1,960 a year, in total. Assuming that three ATCs similar to Davydiv VTC share the investment costs for a centralized pellet machine, the benefits would mean an investment recovery not longer than one year.

Wood

There are three categories of wood waste in Davydiv: sawdust and chips, wood pallets, and cut-offs from wood production. Wood waste, sawdust, and chips represent 56 tonnes (58%) of the waste estimated in the study. The main usage for the waste is for heating the industrial premises, followed by recycling for wooden particle boards or secondary uses such as bedding for horses. No wood waste is sent to landfill. The second-best option after prevention would be to recycle wood waste and produce new products (e.g. particle boards or pellets) rather than putting it into secondary use or energy recovery. However, this would require participation from a large number of producers to be cost-effective. The study estimates that a total of 12.8 m³ of wood waste is produced per month across Davydiv VTC.

Paper and cardboard

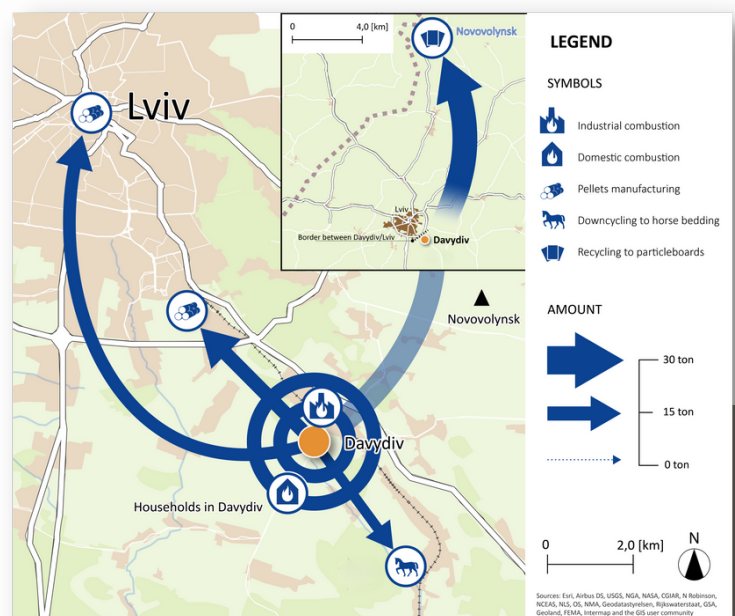
This waste consists of packaging and scraps made of paper and cardboard. In general, there is demand for paper and cardboard waste in the area. However, the difficulty of processing plastic contaminants in the waste is impeding efforts to increase recycling. Currently, 170 tonnes of paper and cardboard waste are sent to recycling centres with many exchanges between the two cities. This volume could be increased through improvements in sorting. Hence, the system would be more efficient if the logistics where better planned as more cardboard would be sent to recycling instead of landfill. Paper bags from cement production also contribute to waste from packaging in Davydiv VTC. This could be reduced by deploying reusable sacks and larger containers.

Plastic

Plastic waste is made up of plastic containers and other packaging, cut-offs from production, and glue for the lamination of building blocks - with the majority of the waste being recycled by companies in Slavuta and Lviv. PET duct tape is a common type of waste produced in Davydiv. It is kept in storage by the generator due to a lack of facilities needed to process or dispose of this type of waste. The best solution would be to undertake preventive measures to reduce the use of this material. For plastic container waste, take-back systems should be the main method of waste management to prevent its generation. Polyethylene is currently disposed of in landfill even though it could be recycled. Therefore, collection systems need to be improved to reduce collection and transportation costs and impacts (e.g. by municipalities having an active role in combining collection from industrial sources with collection from households).

Organic

Organic waste mainly comes from agro-industry activities, and it is made up of agricultural residues and carrion from farms. Organic waste is currently used as animal feed or fertilizer, which should be the preferred method of waste management in order to retain value.



Results

Opportunities and solutions to move towards more circular waste flows were identified for each material, together with the quantification of the financial and environmental potential.

Slavuta CTC

Overall, access to specific information on the selected waste in Slavuta CTC was limited. However, other waste streams such as gypsum waste were explored, resulting in the greatest environmental potential for recycling. Recycling 2,000 tonnes of gypsum could save 360 tonnes of CO₂ equivalent per year. In terms of financial benefits, the measure that demonstrated the best potential was the incineration of non-recyclable and non-reusable waste, with estimated savings of up to €52,288 per year.

Wood

Three different categories of wood waste were sampled: sawdust and chips, wood pallets, and wood cut-offs from woodworking and furniture production. All the wood waste is combusted onsite or at another enterprise, with or without energy recovery. Upgrading to recycle options before combustion would produce greater value. At the same time, combustion without any energy recovery should be avoided.

Plastic

In Slavuta, the plastic waste generated from the sampled enterprises in the IWM exercise is similar in nature to that produced in Davydiv. However, there is a lack of information on the destination of plastic waste in Slavuta. Some specific practices identified in companies could be improved, such as combustion that is processed against a fee or implementing take-back systems (which would also generate financial savings).

Paper and cardboard

In Slavuta, paper and cardboard waste comes from packaging and scraps of paper. There is demand for paper and cardboard waste in the area but the main challenge remains the processing of plastic contaminants mixed with some paper packages. In Slavuta, all companies reported that they recycled their paper and cardboard waste but improvements could be made, inter alia, by better designing the products to prevent or reduce packaging waste. Most of the recycled paper is milled in Kyiv (almost 300 km away), which results in higher transportation costs. These costs could be reduced by strengthening facilities at the Poninka mill (12 km away) to enable it to receive higher volumes of waste.

Ceramic

In Slavuta, only one company out of the three-producing furniture for bathrooms provided relevant data on ceramic waste due to rejected products (sanitary line). Refurbishing and recycling options should be explored, such as the options available for ceramic scrap (to recycle it as tiles or as building material for roads).



Recommendations for more circular waste management

The legal framework for waste management should be strengthened. Despite the implementation of new laws, there is still a lack of focus on the prevention of waste. Definitions and priorities regarding industrial waste should therefore be clarified. Information sharing should also be improved with local authorities and control of compliance with waste laws should be tightened. There should also be greater efforts to coordinate the handling of household and industrial waste. Additionally, financial incentives should be increased through higher gate fees for the disposal of waste, while financial support should be improved for certain investments needed in the recycling system.

A digitalized information system for waste is recommended in order to improve efficiency, along with a regional information function to support the development of circular industrial waste management. To facilitate the development of the technology needed for efficient waste management, the study recommends a national plan for incineration plants, as well as regional plans for recycling facilities.

Even in a more circular future, waste combustion will be needed. During the waste mapping exercise, the municipalities and the RECP Centre put forward several possible explanations for why waste incineration plants were not being built (including legal issues and the lack of financing). At present, there are no legal obstacles to building incineration plants in Ukraine, but there are some regulatory uncertainties that should be clarified. Judging from the discussions during the waste mapping exercise, there is also a need for higher levels of awareness among public-sector decision-makers on what is possible to achieve regarding incineration, according to the current legislation. To make it financially viable to build waste incineration plants, tariffs for handling waste should be increased while environmental taxes to dispose of waste should be raised to create incentives. Landfill remains the cheapest way to manage waste in Ukraine. Environmental tax in the EU for disposing of waste in landfill is roughly 30 to 500 times higher than the Ukrainian level.

Lessons learned for waste mapping

- Collection of information from the enterprises is needed to get enough data of sufficient quality to be able to match waste producers with waste users later in the process. That means that the time for visits and discussions with each waste producer needs to be included in the time plan.
- Larger enterprises have more data but are more complex to cooperate with and their needs are more technically advanced. Small and Medium-sized Enterprises (SMEs) have less data, but improvements are easier to find. For SMEs, the improvements often involve coordinating several SMEs with similar needs.
- There is the possibility (as well as preference) to perform the waste mapping for an area larger than the territories of each ATC.
- The financial potential was the factor of most interest to the participants in the waste mapping.



Read more

Industrial Waste Mapping in Pilot Areas of Azerbaijan
Industrial Waste Mapping in Pilot Areas of Georgia



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