COMPARATIVE ANALYSIS OF WASTE GENERATION AND ACCUMULATION IN UKRAINE AND EU

The volume of waste generation and accumulation in Ukraine and European countries is analyzed on the basis of the analysis of waste generation statistics in the EU (EU-28) and Ukraine. The volumes of annual formation and accumulation of waste according to different classification, including by hazard classes, types of economic activity, materials from which they are composed and their distribution by regions of Ukraine, the most formed and accumulates mineral and solidified waste. In 2013, 15.2 billion tonnes were accumulated in Ukraine, including about 12 million tonnes of household and similar wastes (excluding the territory of ATO and Crimea). In 2016, more than 12 billion tonnes of waste was accumulated in Ukraine, including about 12 million tonnes of hazardous waste and over 170 million tonnes of household and similar waste (excluding the territory of ATO and Crimea). In 2013, 15.2 billion tonnes were accumulated including ATO and Crimea (Table 1). [1]

These tables indicate that by 2013 the amount of generated and accumulated waste has been increasing, and since 2014 it has decreased. This is explained by the fact that Ukrainian statistics do not currently take into account enterprises located in the occupied territories of Donbass and Crimea.

Introduction. The rapid development of economic activity in the world, and in particular at the end of the last millennium, has led to the overuse of non-renewable natural resources and increased anthropogenic pollution on the environment, among which is the formation and accumulation of waste from production and consumption on the earth’s surface. Waste generation differs depending on economic activity in different countries and reflects socioeconomic differences and different interpretations and identities cation of types of waste. The largest amount of waste is generated in countries with advanced mining and metallurgical industries. But countries that reject these sectors have high levels of domestic consumption. This is why household and similar wastes and construction and demolition wastes are generated here.

The purpose of the work. Analysis of the volume of generation and accumulation of waste in Ukraine by types of economic activity, by hazard classes, by categories of materials from which they are composed and their distribution by regions of Ukraine. Comparison of waste generation and accumulation indicators in Ukraine and EU countries.

Results and Discussion. According to the State Statistics Service of Ukraine, over 200 million tonnes of waste have been generated annually in recent years, including 0.6 - 1.6 million tonnes of hazardous waste and over 10-12 million tonnes of household and similar waste. In 2016, more than 12 billion tonnes of waste was accumulated in Ukraine, including about 12 million tonnes of hazardous and over 170 million tonnes of household and similar wastes (excluding the territory of ATO and Crimea).

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land, Romania, Italy, Sweden, the Netherlands, Spain, and Finland (Figure 1). [2]

For example, in 2016 waste was generated (mln t): in Germany - over 400, in France - 300, in Poland, Romania - about 200, Italy - more than 160., Netherlands, Sweden - more than 140, Spain, Finland - more than 120. In such EU countries as Turkey, Greece, Belgium, Austria, Serbia, 60-70 million tonnes of waste was generated, Czech Republic, Estonia, Denmark - more than 20 million tons, Hungary, Ireland, Portugal - 14, 15, Luxembourg, Slovakia, Norway - 10-11. From 1 to 6 million tonnes are generated in other countries. In Ukraine, excluding the Crimea and the occupied part of the Donbas, almost 300 million tonnes of waste was generated in 2016.

The State Statistics Service of Ukraine gradually keeps records of waste in accordance with the State Classifier of Waste, which is built on the same basis as the State Classifier of Products and Services, which classifies waste by their origin. Waste is accounted for by different classification (by hazard classes, types of economic activity and households, by waste categories, for disposal operations). In the same way, European Union waste is also managed.

Table 1. Accumulation and generation of waste in Ukraine, mln t

| Year | Generation | Including Hazard | Including Household and Similar | Accumulation | Including Hazardous | Including Household and Similar |
|------|------------|------------------|-------------------------------|--------------|--------------------|-----------------------------|
| 2010 | 419,192    | 1.6              | 12,110                        | 13,267,455   | 16,236             | 135,945                     |
| 2011 | 447,641    | 1.4              | 10,356                        | 14,422,372   | 15,158             | 141,251                     |
| 2012 | 450,727    | 1.4              | 13,787                        | 14,910,105   | 14,325             | 150,516                     |
| 2013 | 448,118    | 0.9              | 14,501                        | 15,167,369   | 12,642             | 160,118                     |
| 2014* | 354,803    | 0.7              | 10,748                        | 12,115,241   | 11,951             | 166,112                     |
| 2015 | 312,267    | 0.6              | 11,492                        | 12,281,353   | 11,996             | 170,306                     |
| 2016 | 295,870    | 0.6              | 11,563                        | 12,451,659   | 12,102             | 174,514                     |

The generation of waste in Ukraine by type of economic activity is shown in Fig. 2.

The largest volumes of waste in Ukraine are generated by extraction of minerals -237.5 mln t (84.48%) and in manufacturing - 34.1 mln. t (12.13%) to which both metallurgical and chemical enterprises and food and beverage industries belong. Only 6 million tonnes (2.08%) of municipal waste are generated. For comparison, in developed countries such as Germany and France, the largest amounts of waste are generated in the construction and demolition of buildings (construction waste) - 220.5 and 224.4 million tons, respectively, and in the manufacturing industry 55.9 and 22.1 million. t respectively and 5 times more household garbage is collected at 37.4 and 29.2 million tons respectively (Figs. 3,4). The main sources of waste generation and accumulation in Ukraine are the following sectors of economy (Tables2). [3]
Fig. 2. Waste generation by type of economic activity in Ukraine, 2016, mln t.

Table 2 - Main sources of generation and accumulation of industrial waste in Ukraine, 2011.

| Industry                             | Formed, mln t | % of total | Mined, mln t | % of total |
|--------------------------------------|---------------|------------|--------------|------------|
| Mining industry, incl.               | 331.4         | 74.3       | 10978        | 76.1       |
| Mining of metal ores                 | 267           | 59.2       | 7910.9       | 54.9       |
| Mining of coal, lignin, peat         | 46.2          | 10.2       | 2269.4       | 15.7       |
| Mining of other minerals             | 18.2          | 4          | 797.3        | 5.5        |
| Processing industry - total, including | 78.6          | 17.5       | 1953.4       | 13.6       |
| Metallurgical production             | 59.5          | 13.2       | 1767.0       | 12.3       |
| Chemical production                  | 3.9           | 0.9        | 104.3        | 0.7        |
| Manufacture of food products and beverages | 10.4        | 2.3        | 2.2          | 0          |
| Other manufacturing                  | 4.8           | 1.1        | 79.9         | 0.6        |
| Other economic activities - total, including | 35.8        | 8          | 1491.4       | 10.3       |
| Energy, gas and water production and distribution | 16.7        | 3.8        | 367.4        | 2.5        |
| Other economic activities             | 19.1          | 4.2        | 1124.0       | 7.8        |
| Household odarstva                   | 5.1           | 1.1        | -            | -          |
| Total:                               | 450.9         | 100        | 14422.4      | 100        |

Thus, over 70% of waste in Ukraine was formed and accumulated in the mining industry, in t. ch. 50% more than in the metal ore mining.

According to the Waste Classifier DK 005-96, the ores of metal ores extracted in Ukraine include extraction wastes and sludges and "tails" of iron ore enrichment, as well as residues (dust, powder, etc.) of production of iron ore balls, sinter, iron flux, and waste enrichment of non-ferrous metal ores (manganese), except uranium and thorium ores, and red alumina sludge from imported bauxite, waste from the extraction and enrichment of titanium, zirconium and nickel.
Coal, lignin, peat waste also belongs to waste sub-standard coal, sludge and "tails" from processing plants, etc.

Other minerals mined in Ukraine include granite, limestone, chalk and dolomite, refractory clays, construction stone. The waste generated in this case is dust, crumbs, debris.

In the processing industry, more than 17% of waste is generated, incl. more than 13% - in the metallurgical industry, in the process of which the following types of waste are generated: domains, steelmaking and ferroalloy slag and sludge.

The structure of the accumulated waste production of metals of basic metals in Ukraine as of 01.01.2011 is shown in the diagram (Fig. 4). [5]

The vast majority of waste according to this classification is generated and accumulated (79%) is slag of metallurgical and ferro-alloy production. Metallurgical sludge is dust that is trapped by air-purifying equipment with the help of liquid and sent to the sludge collector. After settling, the water is discharged into the surface water bodies, and the solid part, if not used, accumulates in the sedimentation tanks.

The State Statistics Committee of Ukraine keeps records of waste, also, on the materials from which they are composed. Dynamics of waste generation and accumulation on the materials from which they consist are given in Table 3. [5]
Table 3 - Dynamics of waste generation and accumulation on the materials from which they consist, thousand tons (as of 2012)

| Waste material name                              | Formation | Quantity  | %  | Accumulation | Quantity  | %  |
|--------------------------------------------------|-----------|-----------|----|--------------|-----------|----|
| Total, of which:                                 |           | 450938.1  | 100|              | 14422372.0| 100|
| Waste of acids, alkalis or salts                 |           | 1023.5    | 0.2|              | 16544.9   | 0.1|
| Chemical sludge and residues                     |           | 3201.7    | 0.7|              | 92575.9   | 0.6|
| Industrial sewage sludge                         |           | 9802.1    | 2.2|              | 96033.1   | 0.7|
| Metal waste                                      |           | 8317.3    | 1.8|              | 84066.8   | 0.6|
| Animal and vegetable waste                       |           | 12820.7   | 2.8|              | 2371.0    | 0.02|
| Household and similar waste (PPV)                |           | 10,976.2  | 2.4|              | 141,251.3 | 1.0|
| Mixed and undifferentiated materials             |           | 7,192.4   | 1.6|              | 194,346.4 | 1.3|
| Ordinary deposit                                 |           | 581.8     | 0.1|              | 5087.5    | 0.04|
| Empty breed of dredging                          |           | 47,371.8  | 10.5|             | 2,871,807.0| 19.9|
| Mineral waste                                    |           | 317,856.3 | 70.5|             | 10,359,875.0| 71.8|
| Waste combustion                                 |           | 21,394.1  | 4.7|              | 549,244.2 | 3.8|
| Abrudneny soil and contaminated gob of dnpohlybyuvannya |   | 15.1      | 0.003|            | 132.9     | 0.001|
| Other                                            |           | 10,385.1  | 2.3|              | 9,035.7   | 0.1|

The largest amount of waste by main categories of materials produced in Ukraine is mineral waste (70%), as well as empty rock dredging (10%), which includes soil-forming rocks and other sedimentary rocks lying at the top of the geological section. Combustion wastes (slag and TPP sludge) make up a considerable percentage - over 6%; animal and vegetable waste - about 3%; industrial water sediment; animal excrement, urine and manure, household and similar wastes, metallic wastes, mixed and undifferentiated materials and other wastes are less than 2%.

In the countries of the European Union the categories of materials of which they consist are differentiated as follows: Chemical and medical waste; Recycling waste; Equipment; Animal and vegetable waste; Ordinary mixed waste; Common mules; Mineral and stabilized wastes. Waste generation from materials from which they are collected in EU countries and in Ukraine is shown in Table 4. Table 4. Waste generation from materials from which they are composed in EU countries and in Ukraine, 2016. [2]

Every year in EU countries produced more than 2 billion. Tons of waste. In 2016, they produced 2.45 billion
tonnes, 78.87% (1935.97 million tonnes), of which - in 9 countries from 28: Germany, France, England, Poland, Romania, Italy, Sweden, the Netherlands and Spain. Mineral and solid waste from 39.91% - in Italy to 80.92% - in France is the largest in all countries.

Thus, much more mineral and solidified waste is generated in Ukraine than in developed EU countries, animal and vegetable wastes, similar to Germany and the Netherlands, and recycling waste and defective equipment are not accounted for at all in Ukrainian enterprises. It says that overall, 52-54 million tonnes of chemical and medical waste are generated annually in the EU countries in recent years. [3]

Waste generation and accumulation in Ukraine by region is very uneven.

The chart shows the amount of waste collected by region. By quantity of waste we divided the regions of Ukraine into 3 groups. The first area includes hundreds of millions of tons of waste, the second - tens of millions of tons, the third - less than 10 million tons. http://www.ukrstat.gov.ua/

Dnipropetrovsk region is leading the volume of accumulated waste, because it is here where the most powerful plants are located, which extract and enrich iron, manganese ores, titanium-zirconium placers, coal and processing metallurgical and ferroalloys.

The diagram shows that in Dnipropetrovsk region, more than 10 billion tonnes have been accumulated at the waste disposal sites. According to our estimates, more than 90% of them are waste from the extraction and enrichment of iron and manganese ores (Kryvybas and Nikopo Ores Manganese basin and steel mills in Donetsk region, on the territory of Ukraine controlled much of the waste accumulated at the enterprises of mining and processing of coal, coke plants and steel mills. okuchyevsky flux-dolomithy plant, which until 2013 was formed and had accumulated the largest volumes of waste remaining in uncontrolled areas.

In Kirovograd region 99.9% of the waste accumulated in three companies: Petrovsky Quarry Central Iron Ore Enrichment Works, Beam "Scherbakivske "And the mine" Ingulskaya "of the East Mining Company. At the Petrovsky Quarry, waste of iron ore was accumulated, in the territory of the subdivisions of the East Mining Company - waste of uranium ore extraction and enrichment. At the same time, almost 80% of the waste from the total area was accumulated at the Petrovsky Quarry.

In the Lviv region more than 96% of the waste is accumulated at four enterprises: OJSC "Lviv Coal Company", 6 mines of SE "Lvivvugillya", Novoyavorivske SE "Ekotransenergo" and Dobroivskaya TPP.

In Zaporizhzhya region, almost 90% of waste was accumulated at 5 enterprises. This is JSC "Zaporizhstal", where metallurgical (iron) slag and sludge have been accumulated, Zaporizhzhya TPP, where coal ash has been accumulated, LLC "Remondis Zaporizhzhia" - the largest enterprise for collecting household waste from the public, JSC "Zaporizhzhia ferroalloys plant" metallurgical use and dust of gas treatment plants and JSC "Zaporizhzhya Aluminum Production Plant", which contains more than 10 million tons of red sludge.

In the Luhansk region, in the territory controlled by Ukraine, there are coal enterprises, in the process of which coal and mineral wastes are generated.

The second group includes the areas where the most powerful TPPs are located (Trypillia, Zmiivska, Ladyzhynska, Burystynska), which give 60-70% in waste accumulation, or one enterprise, such as Mykolaiv Alumina Plant, Sumykhimprom Production Association.

The third group includes regions in which 70-99% of waste is municipal.

The relative indicator of waste accumulation by regions of Ukraine is shown in the diagram (Fig. 6).

Diagram clearly illustrates that in Dnipropetrovsk region, waste was collected 14 times more than the average in Ukraine, in Donetsk region - almost 1.5 g more than the average in Ukraine. In all other areas, this figure is less than the national average.

It should be noted that the amount of accumulated waste in our country is much higher, because the State Statistics Service receives information only from operating enterprises. Much of the waste was left behind by the Soviet Union, at enterprises that no longer exist.

According to the Ministry of Energy and Environmental Protection, 35 billion tonnes of waste have been accumulated in the country. Of the largest waste generators, 14 are located in the Dnipropetrovsk region (including enterprises that rank in the first five steps of the rating), 9 in Donetsk, 3 in Poltava, 2 in Kirovohrad and Zaporizhzhia, and 1 in Ivano- Frankivsk, Mykolaiv, Ternopil and Lviv regions. [6]

The top 10 pollutants that generate the most waste are as follows:

PrAT «Pivnichny HZK» (m. Kryvyi Rih, Dniproprovsk oblast); PrAT «Inhuletskyi HZK» (m. Kryvyi Rih, Dniproprovsk oblast); PrAT «Tsentralnyi HZK» (m. Kryvyi rih, Dniproprovsk oblast); PAT «ArselorMittal Kryvyi Rih» (m. Kryvyi Rih, Dniproprovsk oblast); PAT «Pivdennyi HZK» (m. Kryvyi Rih, Dniproprovsk oblast); TOV «Ierystivskyi HZK» (m. Horishni Plavni, Poltava oblast); PrAT «Novotrotske rudoupravlinnia» (smt. Novotrotske, Donetsk oblast); PrAT «Mariupolskyi metalurhiinyi kombinat imeni Illicya» (m. Mariupol, Donetsk oblast); Strukturnyi pidrozdll PrAT «MMKim. Illicya» HZK «Ukrmehanobr» (m. Kryvyi Rih, Dniproprovsk oblast); AT «Pokrovskyi hirnycyo-zhabachuvальнйy комбінат» (m. Pokrov, Dniproprovsk oblast).

Almost all enterprises, with the exception of PJSC «Mariupol Metallurgical Combine named after M. Ilyich », is a mining and processing plant, on which the overburden and the enrichment of iron and manganese ore are mainly accumulated. For some types of mineral raw materials
| Country       | Total country mln. | Tons% | Mineral and hardened waste mln. | Tons% of chemical and medical waste mln. | Tons% of animal and vegetable waste mln. | T% | General mules mio. | T% | Waste recycling mln. Tons | % | Областина, млн. т | % |
|--------------|--------------------|-------|---------------------------------|------------------------------------------|------------------------------------------|----|-------------------|----|----------------------|---|------------------------|---|
| Total EU, million tonnes | 2454,72            | 100,00| 1796,60                         | 73,19                                    | 54,15                                    | 2,21| 95,28             | 3,88| 20,71                | 0,84| 246,13                 | 10,03| 17,83                 | 0,73|
| Germany      | 400,07             | 16,30 | 261,39                          | 65,33                                    | 8,92                                     | 2,23| 15,62             | 3,91| 1,49                 | 0,37| 39,38                  | 9,84 | 2,43                  | 0,61|
| France       | 323,47             | 13,18 | 261,76                          | 80,92                                    | 4,96                                     | 1,53| 11,81             | 3,65| 1,21                 | 0,37| 34,90                  | 10,79| 2,44                  | 0,75|
| England      | 277,26             | 11,29 | 141,64                          | 51,09                                    | 4,80                                     | 1,73| 10,29             | 3,71| 4,17                 | 1,50| 43,11                  | 15,55| 3,80                  | 1,37|
| Poland       | 182,01             | 7,41  | 122,71                          | 67,42                                    | 2,99                                     | 1,64| 3,19              | 1,75| 0,66                 | 0,36| 13,56                  | 7,45 | 0,70                  | 0,39|
| Romania      | 177,56             | 7,23  | 163,36                          | 92,00                                    | 0,95                                     | 0,54| 0,86              | 0,49| 0,20                 | 0,11| 5,82                   | 3,28 | 0,13                  | 0,08|
| Italy        | 164,00             | 6,68  | 65,46                           | 39,91                                    | 14,29                                    | 8,71| 7,85              | 4,79| 6,08                 | 3,70| 28,10                  | 17,14| 3,03                  | 1,85|
| Sweden       | 141,62             | 5,77  | 101,83                          | 71,90                                    | 1,29                                     | 0,91| 2,38              | 1,68| 0,40                 | 0,28| 6,31                   | 4,45 | 0,85                  | 0,60|
| Netherlands  | 141,02             | 5,75  | 104,04                          | 73,77                                    | 2,40                                     | 1,70| 15,20             | 10,78| 0,66                 | 0,47| 8,39                   | 5,95 | 0,54                  | 0,39|
| Spain        | 128,96             | 5,25  | 67,03                           | 51,98                                    | 2,66                                     | 2,06| 9,14              | 7,08| 1,46                 | 1,13| 12,56                  | 9,74 | 1,21                  | 0,93|
| Amount       | 1935,97            | 78,87 | 1289,21                         | 43,26                                    | 76,35                                    | 16,32| 192,14            | 15,13|                     |         |                       |         |                       |     |
| Other countries | 518,75            | 21,13 | 507,39                          | 73,19                                    | 10,89                                    | 18,93| 4,39              | 53,99| 2,70                 |         |                       |         |                       |     |
| Ukraine      | 295,87             | 1,44  | 226,20                          | 76,4                                     | 1,44                                     | 0,49| 13,89             | 4,69| 3,90                 | 1,32| ...                    | ...  | ...                   |     |
Fig. 5 The presence of waste in the regions of Ukraine

![Graph showing waste accumulation in different regions of Ukraine]

Fig. 6. Relative Indicator of waste accumulation in different regions of Ukraine

![Graph showing relative indicator of waste accumulation in 2016]
Conclusions
1. According to the State Statistics Service of Ukraine, more than 12 billion tons of waste have been accumulated, including 12 million tons of household waste, 0.6 million tons of hazardous waste. Their annual formation is over 200 million tons, including more than 11 million tons - household waste, 0.6 million tons - hazardous waste.
2. More 2.5 billion tonnes of waste are generated annually in the EU (EC-28). More than 70% of which are in 10 countries: Germany, France, England, Poland, Romania, Italy, Sweden, Netherlands, Spain, and Finland.
3. The largest amounts of waste in Ukraine are generated by the extraction of minerals -237.5 million tons (84.48%) and in manufacturing - 34.1 million tons (12.13%), to which they belong, as metallurgical and chemical companies so food and beverage production and more. Only 6 million tonnes (2.08%) of municipal waste are generated.
4. The structure of accumulated waste production of metals of basic in Ukraine has the following character:
5. By major categories of materials, the largest amount of waste generated in Ukraine is mineral waste (over 70%), as well as empty rock from dredging operations (10%), to which soil-forming rocks and other sedimentary rocks lying at the top belong, geological section. Combustion wastes (slag and TPP sludge) make up a considerable percentage - over 6%; animal and vegetable waste - about 3%; industrial water sediment; animal excrement, urine and manure, household and similar wastes, metallic wastes, mixed and undifferentiated materials and other wastes are less than 2%.
6. By amount of waste, the regions of Ukraine are divided into 3 groups. The first area includes hundreds of millions of tons of waste, the second - tens of millions of tons, the third - less than 10 million tons.
7. The volume of accumulated waste leads the Dnipropetrovsk region, because it is here where the most powerful plants are located, which extract and enrich iron, manganese ores, titanium-zirconium placers, coal and processing metallurgical and ferroalloy plants. The relative indicator of waste generation by regions of Ukraine illustrates that in Dnipropetrovsk region, waste was collected 14 times more than the average in Ukraine, in Donetsk region - almost 1.5 g more than the average in Ukraine. In all other areas, this figure is less than the national average.
8. Reduction of man-made load from industrial waste is possible due to the use of innovative technologies in the extraction and enrichment of ores and in the metallurgical industry, which will increase the extraction of useful components from mineral resources extracted from the depths, as well as improve the monitoring of waste disposal sites, namely and mineralogical composition, physical properties to solve the ways of their industrial use.

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Анотація. У статті проаналізовано обсяги утворення та накопичення відходів в Україні та європейських країнах на підставі аналізу статистичних даних щодо утворення відходів в країнах ЄС (ЄС-28) і Україні. Наведено обсяги щорічного утворення та накопичення відходів за різною класифікацією, в т. ч. за класами небезпеки, видами економічної діяльності, матеріалами, з яких вони складаються. Показано, що в Україні до 2013 р. щорічно утворювалось понад 400 млн. т відходів, в тому числі понад 1 млн. т небезпечних відходів та понад 12 млн. т побутових. Після окупації Донбасу і Криму утворюється близько 300 млн. т, в т. ч. понад 0,5 млн. т небезпечних та 12 млн. т побутових. В країнах ЄС понад 70% відходів утворюється в 10 країнах: Німеччині, Франції, Англії, Польщі, Румунії, Італії, Швеції, Нідерландах, Іспанії та Фінляндії. В Україні за видами економічної діяльності найбільші обсяги відходів утворюються при добуванні мінеральної сировини та переробній промисловості, найменші – в процесі очищення води та при будівництві та знесенні будівель. В країнах ЄС-28 ці показники мають інший характер. Наприклад у Німеччині найбільше відходів утворюється при знесені будівель і в переробних галузях економіки, найменше – в сільськогосподарському, лісовому та рибному господарствах. За категоріями матеріалів, з яких вони складаються, в Україні найбільші обсяги відходів утворюються і накопичуються у Дніпропетровській, Донецькій, Запорізькій областях, де розташовані підприємства з видобутку та обробки мінерального вугілля, матеріалів металургійного виробництва, металургійних комбінатів та комбінатів хімічної промисловості. За класами небезпеки відходів утворюється і накопичується мінеральних і затверділих відходів. В Україні найбільші обсяги відходів утворюються і накопичуються у Дніпропетровській, Донецькій, Запорізькій областях, де розташовані підприємства з видобутку та обробки мінерального вугілля, матеріалів металургійного виробництва, металургійних комбінатів та комбінатів хімічної промисловості. За класами небезпеки відходів утворюється і накопичується мінеральних і затверділих відходів. Показано, що у сільськогосподарському, лісовому та рибному господарствах. За категоріями матеріалів, з яких вони складаються, в Україні найбільші обсяги відходів утворюються і накопичуються у Дніпропетровській, Донецькій, Запорізькій областях, де розташовані підприємства з видобутку та обробки мінерального вугілля, матеріалів металургійного виробництва, металургійних комбінатів та комбінатів хімічної промисловості. Залежно від кількості відходів регіони України класифіковано на три групи. До першої віднесено регіони з обсягами накопичених відходів – мільярди тонн, до другої – десятки мільйонів тонн, до третьої – менше 10 млн. тонн.